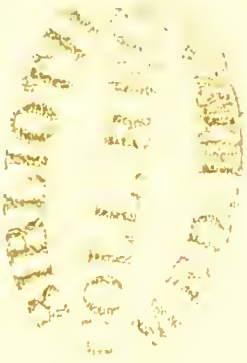
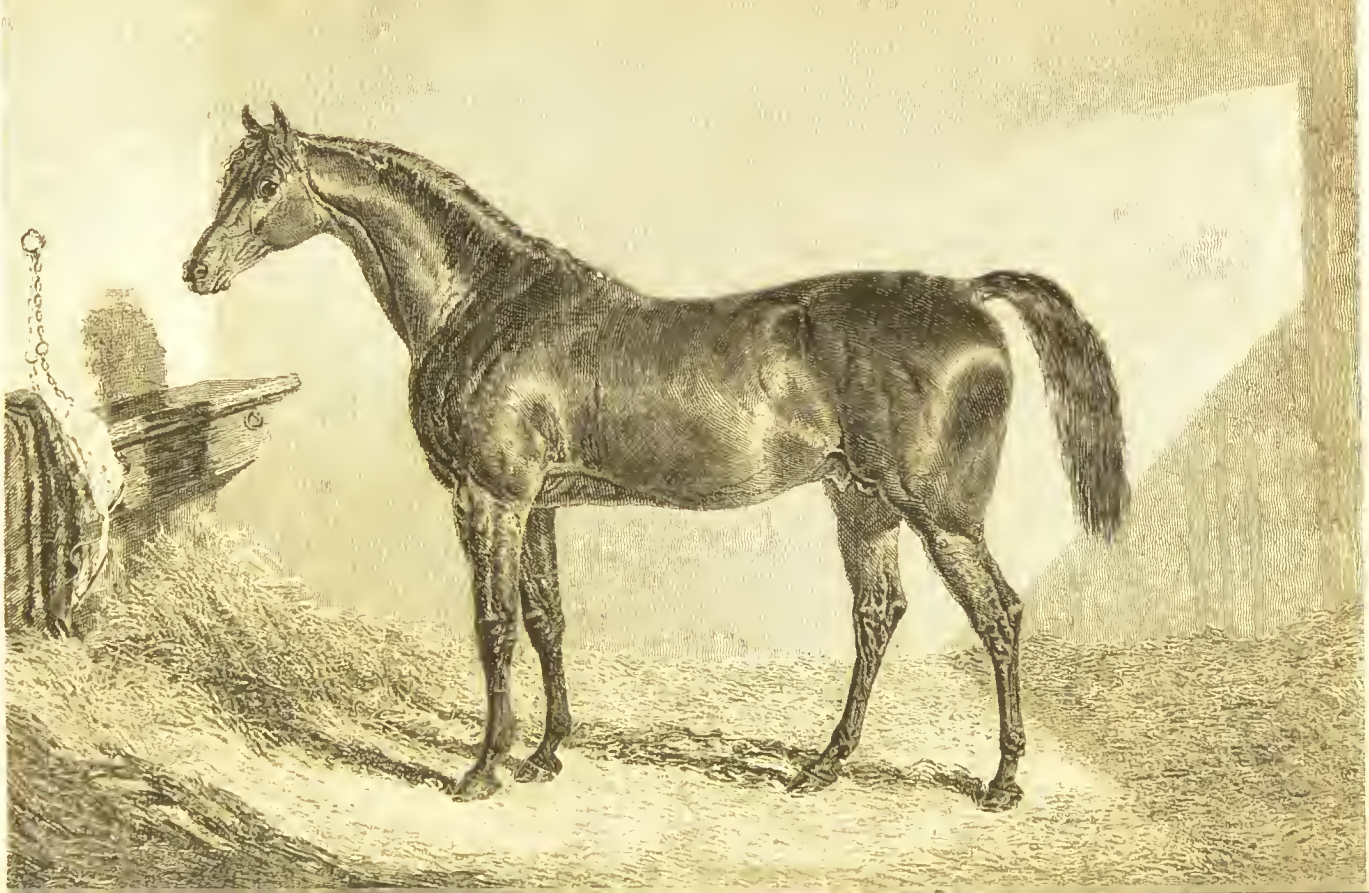
MANUAL OF VETERINARY SCIENCE.





MANUAL

OF

VETERINARY SCIENCE

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SECOND EDITION—REVISED AND ENLARGED.

EDINBURGH:
ADAM AND CHARLES BLACK.
1862.

PRINTED BY R. AND R. CLARK, EDINBURGH.

PREFACE TO THE SECOND EDITION.

THE first edition of this little work having been long out of print, and frequent applications being made for it, the Author, not having been able to carry out his intention of producing a larger work, has been induced, in republishing "The Manual," to revise and enlarge it in many essential parts, which it is hoped will render it more useful.

EDINBURGH VETERINARY COLLEGE,
30th September 1862.

PREFACE TO THE FIRST EDITION.

THE following Treatise on Veterinary Seienee was prepared as the artiele under that head in the seventh edition of the Eneyelopædia Britannica. In adapting it to the purpose in view, the writer was neeessarily obliged to eonsider the general plan and objeets of the great work of whieh it was designed to form a part, and so to eondense his information, as to bring the treatise within the limits preseribed by the editor. It will aecordingly be found, that the information has been eompressed to the greatest degree of whieh the subjeet was suseeptible; and in its present shape, the author is aware that it can only be eonsidered as a coneise epitome of the scienee of whieh it treats.

Condensed, however, as it eonfessedly is, it is believed that in this separate form it may not be

unacceptable to those who have not time or inclination to study more extensive works on Veterinary Science, but who still may be desirous to possess a brief digest of information on all the important topics connected with the subject.

To Students of Veterinary Medicine it is believed this manual will be useful as a body of notes or memoranda upon the various branches of the science, which will considerably abridge their labours, and assist their studies. If it does not materially add to the information of the established practitioner, he may yet find that it possesses some value as a remembrancer of the leading points upon which sound practice is founded. To the Amateur it will afford some insight into a subject with which all who have any pretension to a knowledge of horse-flesh, ought to have some acquaintance ; and if they bear in mind that the work contains, in a small compass, a compendious view of the principles upon which alone the diseases of domestic animals can be properly treated they will find it an antidote to the quackery by which many valuable animals are sacrificed, and serious expense and vexation occasioned.

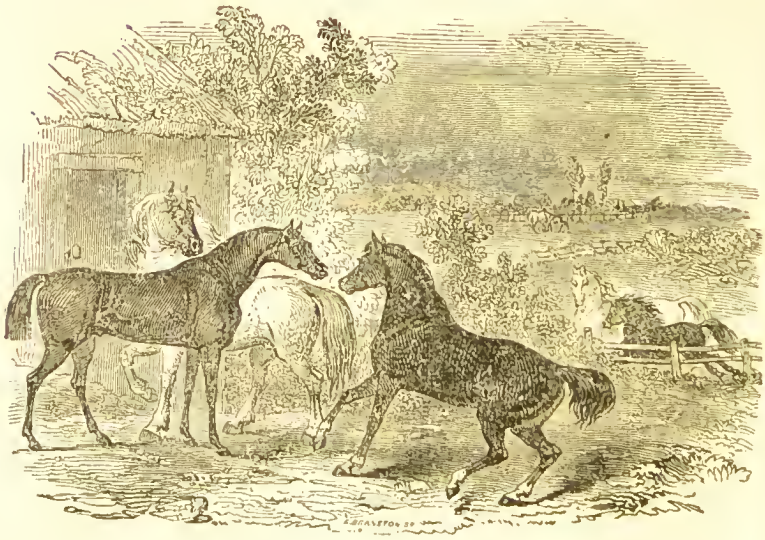
Within the limits of so small a treatise, it cannot be expected that the details of the science can be given as completely as in a more elaborate work ; but it is presumed that its conciseness will offer some compensating advantages, by affording at once a systematic view, and numerous practical hints, digested on a simple and intelligible plan, and consequently better adapted for the purposes of some readers, than works of greater extent and labour.

While therefore the present treatise does not profess to give a full development of the views entertained upon the various branches of Veterinary Science, it may be regarded as forming the elements of a more extended work, if the present shall be considered worthy of the patronage of the public.

Where the views of the author differ from those expressed by previous writers, and seem to require fuller explanation, the reader is requested not to condemn rashly, but by careful investigation to endeavour to ascertain the truth ; and it is hoped that the impartial inquirer will at least conclude that there are strong reasons for the opinions

advanced, and that they deserve the fullest investigation. The whole is submitted as the result of experience and study, founded on facts; and it is hoped that it will prove useful to the public and the profession.

EDINBURGH, *Dec.* 1, 1841.



VETERINARY SCIENCE.

The knowledge and the enlightened treatment of the diseases of domestic animals have, in this country, been raised to the rank of a science only within the last seventy years. Previous to that time, the art of Farriery consisted in the traditionary lore of the worker in iron, *faber ferrarius*, or smith ; and in later times, in the professional skill of a few medical practitioners, who were not, however, sufficiently careful to ascertain the many striking differences, which exist between the economy of man and that of the lower animals. The modern term *veterinary* derives its origin from the Latin *veterinarius*, an adjective denoting relation to beasts of burden. The same word, used as a substantive, signifies a person who has the care of such beasts. The term veterinary is now so much in general use that any attempt to change it may be considered an innovation; but we cannot help stating that we consider that it would be more correct to use the term zoiatries, for animal medicine, being derived from zoon, an animal, and iatrice, medicine, or physician—hence we have

zoiatrist—physician or surgeon of animals, and accordingly I have adopted the title to our college, of Veterinary or Zoiatric College. The etymology of veterinary is, however, involved in considerable obscurity. The first veterinary school was founded at Lyons in the year 1761, and another was founded at Alfort, near Paris, in 1766. In the year 1792 the Veterinary College of London was established, and it is to this date, that the origin of the science in this country may be correctly assigned. More recently a school of veterinary medicine, founded in 1818, by the author in Edinburgh, and patronised by the Highland and Agricultural Society in 1823, was established by Royal Charter in 1842 as a teaching college.

The science of veterinary medicine must evidently be based upon a minute and accurate knowledge of the structure and functions of all those animals which may require its aid, as also of the disorders and accidents to which these are exposed, and the various resources, whether natural or artificial, available for their cure. This opens a wide field, and shews the value of the light, which may be borrowed from collateral sciences. From the paramount importance which man attaches to every thing which concerns himself, human anatomy, and the sciences of medicine and surgery have, from time immemorial, been prosecuted with the keenest assiduity. Natural history has long had its numerous and enthusiastic votaries, and hence so much knowledge on the subjects of comparative anatomy and physiology. If there be analogies of structure between

man and the "humbler partners of his mortal pilgrimage," when both are in health and strength, sure we are these are not fewer or less striking, when they are labouring under the many ills to which they alike are heirs. From these various sciences much valuable information has undoubtedly been gleaned in aid of that which is now to engage our attention; and we cannot too strongly impress upon the veterinary student, that before he is competent to learn the art of healing, he must have an accurate knowledge of the anatomical structure, and the physiology, of the domestic animals. For the acquisition of this primary branch of the science, I must refer him to the approved elementary treatises, of which a list is supplied at the close of the manual; confining myself to such general allusions concerning these matters as may be unavoidable in the course of the following observations. With such very limited space, I must endeavour to instruct, more by a useful classification and nomenclature, and the exposition of correct principles, than by entering into matters of detail.

I commence with a few general remarks on INFLAMMATION. When a part, like the white of the eye, becomes red, hot, pained, and swollen, it is said to be in a state of inflammation. This disease may be excited in any part of the surface by a wound or other irritation; and there is no internal organ which is not liable to attack, and often without any very apparent cause. Hence inflammation, in one form or other, is the most common disorder which is encountered, and withal the most fatal. It is here proposed to give a short account of the

inflammatory process, more particularly with reference to its nature. Owing to the frequent occurrence of inflammation, and the serious consequences with which it is often attended, it has from the earliest time demanded, and still demands, a great deal of attention; indeed, the greater part of medical and veterinary practice consists in the treatment of some form of inflammation, so that it is obviously of the utmost importance to have as clear ideas as possible with regard to its nature. Unfortunately, however, the subject is surrounded with many difficulties, and the vital powers of the animal body on which the phenomena of inflammation depend are so peculiar and complex in their action, that up to a comparatively recent date, little was known of it of a satisfactory character. Previous to the employment of the microscope as a means of research, our knowledge of the inflammatory process was of the crudest kind; and even at this time, notwithstanding the labours of many observers, it cannot be said that the subject is by any means exhausted. Much, however, has been done in the present century to elucidate this subject, and we are now possessed of information which will enable us to follow with a considerable degree of accuracy the complex phenomena which constitute inflammation. And here, at the outset, it may be observed that there is nothing peculiar in the inflammatory process apart from the ordinary operations going on in the body. Inflammation is a vital process in the same sense as the secretion of bile or of urine is a vital process. As we shall see further on, inflamma-

tion of a part is dependent on the operation, not of foreign and extraneous forces, but of the ordinary and innate vital powers. If, therefore, we knew the *modus operandi* of the vital powers in the ordinary or healthy functions of a part, we would also know the manner in which the vital forces act in inflammation. It is owing to this circumstance, viz., that the forces at work in a state of health are the same as those in a state of disease, that physiology and pathology are closely connected and mutually illustrative of each other. Indeed, properly speaking, there is no such science as pathology; it should rather be called pathological physiology. The difference therefore between a morbid and a healthy process is one not of kind but of degree. There are some processes, however, called morbid, which, considered in themselves, are perfectly healthy, but are regarded as morbid, because they take place at an improper time, or in an improper place.

As health and disease are merely modifications of the same state, and pass gradually into each other, it is impossible to draw a sharp boundary line between them; for this reason a strictly scientific definition of health or disease cannot be given. For practical purposes, however, a part may be said to be diseased when the processes going on in its interior, either endanger its structure, or jeopardise the life of the whole organism.

In order to arrive at a knowledge of the phenomena of inflammation, it will be necessary to examine with the microscope the web of the frog's foot, both in its healthy condition and when irritated in various

ways. If you place the web of a living frog under a microscope which magnifies 250 or 300 diameters, and bring one of the arteries into the focus of the instrument, you will observe the blood rushing along so rapidly that it is impossible to distinguish any of its constituents. If, however, you follow the artery, it will be found to break up into numerous small vessels of uniform size, in which the current of the blood is instantly diminished to such a degree that you can readily see the constituents of that fluid. The combined calibre of the capillaries in which an artery terminates is considerably greater than that of the artery itself, and consequently the rapidity of the current is immediately diminished in accordance with the well-known hydrostatic law, that the rapidity of the current diminishes in proportion to the width of the stream. Even in the capillaries, however, the rapidity of the current is considerable. The corpuscles pass with great facility through the vessels, and do not exhibit any tendency to adhere to each other, or to the walls of the vessels. This is true, both of the red and colourless corpuscles. It is usually stated that the colourless corpuscles move sluggishly along in the *still layer* as it is called, or the fluid portion of the blood, which is in contact with the walls of the capillaries. This is not the case, and, as already mentioned, the colourless corpuscles pass along as rapidly as the others. With regard to the terminal arteries, they are almost entirely composed of muscular fibres. These fibres belong to the plain or unstriped variety. They are arranged in

one or more layers, according to the size of the artery, either circularly or in a spiral manner round the vessel. When they contract, therefore, they have the power to diminish the calibre of the vessel, or, if the contraction be strong enough, to occlude it completely. In this way the small arteries are able to regulate the supply of blood to a part. In addition to their contractile properties, arteries are also endowed with elasticity. Under ordinary circumstances the arteries possess a certain medium size, but when, as sometimes happens, the restraining influence of the muscular fibre is removed, the vessels enlarge from the distending force of the blood, so that a much larger quantity of blood than usual finds its way into the part at the same time, owing to the unrestrained flow of blood. The capillaries beyond enlarge, and the velocity of the current is increased. When the muscular fibres again contract, the artery resumes its original size. The amount which passes through the artery, as well as its velocity, is diminished, and if the contraction proceed far enough, so as to occlude the vessel, the circulation through the artery will be stopped altogether. With regard to the capillaries of the numerous small vessels in which the arteries terminate, they are composed of a thin homogenous membrane, in which nuclei of a flattened form are embedded at intervals. They are possessed of considerable elasticity; but, unlike the arteries, are completely destitute of contractility. Any alteration in size of the capillaries which may take place is not due to any vital property possessed by these vessels, but is

simply owing to the greater or less pressure exerted by the blood upon their walls. As already remarked, the blood flows rapidly through the vessels, much more rapidly through the arteries than through the capillaries—the blood corpuscles, both red and white, shewing no tendency to adhere to each, or to the walls of the vessels. At the same time the current is equable and not pulsatory or jerking, as might have been expected from the rhythmical action of the heart.

If now the web be gently irritated, the artery immediately contracts at the point irritated, the calibre of the artery being either diminished or completely obliterated, and the circulation is either impeded or brought to a stand-still. This condition, however, is soon followed by dilatation—excessive dilatation of the artery—and the blood rushes through in larger quantities, and with greater rapidity than usual; and in consequence of this unrestrained flow of blood through the artery, the capillaries beyond likewise become distended and gorged with blood. In this state the circulation through the vessels—both artery and capillaries—is more rapid than in the normal condition; but the blood corpuscles do not present any deviation from the healthy standard. But now the artery begins to contract and to resume its usual size, and when this takes place, the circulation presents the same appearance as it did prior to the experiment. This experiment may be repeated several times in the same part with the same result. Here it is obvious that we have no inflammatory phenomena before us. The irritation has merely been sufficient to

excite the artery to contraction, and this contraction was followed by complete relaxation or inactivity of the muscular constituents of the artery, in accordance with the general law in physiology, viz., that when a part has been called into vigorous exercise it loses after a time its functional activity, and does not regain it until a period has elapsed proportionate to the degree of its previous activity. If now the web be irritated more strongly, additional phenomena ensue, which we recognize as inflammatory. The arteries dilate immediately, or at most contract spasmodically for an instant, and then dilate much beyond their usual size. The blood then rushes on in larger quantities and with greater speed, and gorges the capillaries as described above. Soon, however, the circulation becomes slower and slower, until it becomes much more languid than the normal circulation. It then oscillates, and at last comes to a complete stand-still. Meanwhile the arteries, as well as the capillaries, are fully distended, and apparently offer no obstacle to the free passage of the blood. It is evident, therefore, that the vessels have no special influence in causing the stoppage of the circulation in a part about to become the seat of inflammation. On examining the blood itself, we find that the corpuscles exhibit a remarkable tendency to adhere to each other, as well as to the walls of the vessels. In the healthy state, as already remarked, the corpuscles have no tendency to adhere to each other or to the vessels, and there is, therefore, little doubt that the viscosity of the corpuscles in the inflamed part is the

immediate cause of the stoppage of the circulation. While the circulation is stagnant in the inflamed part, more is constantly arriving, being propelled forward by the action of the heart, and, in consequence, the capillaries soon become enormously distended with blood corpuscles. Usually the capillaries are distended irregularly so as to form pouches or sinuosities, and sometimes, owing to the greater pressure exerted upon them, they burst, and allow the blood to become extravasated into the tissue. While the viscous condition of the blood corpuscles is the immediate cause of the stoppage of the circulation, it may be asked, what is the cause of this condition of the corpuscles in the inflamed part? The corpuscles, before they come to the inflamed part, are quite normal, when they arrive there they become viscid, and when they leave it they resume their normal appearance. The cause of the viscidity, therefore, cannot be due to any primary alteration in the blood; if it were so, the viscidity of the corpuscles would remain after they had left the part. Accordingly, we are forced to look elsewhere for the cause, and we shall probably find it in the textures themselves.

We have pointed out that in the web of the frog's foot, in which, from its transparency, the various processes which take place in it can be perceived with considerable facility by means of the microscope, the flow of blood through the minute vessels or capillaries becomes slower and slower, and at last comes to a complete stand-still, notwithstanding that the latter are dilated beyond their usual dimensions; and offer, there-

fore, apparently at least, less mechanical resistance to the onward passage of the blood than usual. We further pointed out that this remarkable stagnation of the blood in a part about to become inflamed is not due to any primary alteration of the blood corpuscles, inasmuch as these bodies exhibit no deviations from their usual properties in the vessels before they arrive at, and after they leave, the part about to become the seat of inflammation; so that the cause of the remarkable tendency which the corpuscles shew to adhere to each other and to the walls of the vessels, so as to cause stagnation of the circulation, must be looked for in some alteration which has taken place in the surrounding textures.

In order to understand the nature of the alteration which first takes place in the textures of a part about to become inflamed, so as to cause stagnation of the circulation, it will be necessary to notice the remarkable movements which take place in certain cells, called pigment cells, of the frog's foot, and which appear to have been first noticed by Brucke, of Vienna, in 1852, but more recently and more correctly by Mr. Lister in the Philosophical Transactions for 1858. It has been long known that the frog is capable of changing its colour under certain circumstances—becoming dark when placed in a dark place, and assuming a brighter hue when placed in the light. This capability of the frog of changing its colour, although possessed to a certain extent by all species of frogs, appears to be best marked in the tree-frog. Now, the lighter or darker hue of the frog at different times is due to changes in

the pigment cells above mentioned. These cells are distributed in great numbers in the substance of the true skin, and, in the web at least, are situated also on the walls of the blood-vessels. On examining the web with the microscope, and directing attention to the pigment cells, they are seen to be black bodies consisting of a central portion, from which processes of various sizes radiate. On more careful examination, each cell is found to consist, like all other cells, of a delicate yet firm and elastic membrane, enclosing in its central portion a round colourless body called the nucleus. The nucleus is usually situated in the centre of the cell, but sometimes it is found placed more to one side. In addition to the nucleus the cell contains a transparent colourless fluid, in which float an immense number of minute particles which, when viewed singly, have a brownish tint, but when seen aggregated in groups, present a coal-black appearance. The processes which proceed from the central cell likewise contain fluid and coloured particles, so that they are not solid outgrowths of the cell wall, but may be regarded, as in truth they are, tubular prolongations of the cell itself. These processes, where they arise from the central portion of the cell are usually of considerable breadth, but as they pass outwards, they soon ramify and split up into numerous slender thread-like lines which anastomose or become continuous with similar prolongation from neighbouring cells. All these processes, even the most minute, are hollow, and consist of a delicate membrane, continuous with that of the central cell, and are filled

with a colourless fluid, in which coloured particles float. It follows, therefore, that the contents of the central cell can pass readily into the various processes which radiate from it, and *vice versa* the contents of the processes may, under other circumstances, pass into the cavity of the cell. Moreover, owing to the processes of one cell anastomosing freely with similar processes of neighbouring cells, the contents of one cell may mingle with those of other cells. It is doubtful, however, whether this actually does take place, but at all events we have here a remarkable series of tubes, along which the pigment particles and the fluids in which they are suspended, may move, quite independently of the circulation. It is very probable, if not certain, that the contents of all cells undergo changes similar to those which will be described immediately, but, owing to the absence of coloured particles and the consequent homogenous appearance of their contents, the movements cannot be demonstrated. It is different, however, with the pigment cells. The dark pigment granules contrast strongly with the surrounding colourless fluid and cell membrane, so that any alteration of position which they may experience can be very easily observed.

We have already remarked that the frog is capable of changing from a dark, almost black hue to a comparatively light appearance, and *vice versa;* and this is effected by a change of position of the pigment molecules in the cells. When the pigment granules are aggregated closely together in the cavity of the cell so as to form, under the microscope, a more or less rounded spot,

the colour of the frog is light; when diffused through the cell, and in part through the tubular processes, the colour is darker; and when the pigment granules are still farther scattered through the various ramifications of the cell, so that comparatively few remain in the central portion of the cell, the colour of the frog is almost black. Of course there are some frogs which are never of a very dark colour, but we always find that, without exception, the colour of the frog is darkest the more diffused the pigment granules are through the tubular processes of the cells, and lightest the more concentrated they are in the central portion of the cell. It was supposed by Brucke and Von Wittich that when the pigment was aggregated in the central portion of the cell this was effected by a shortening or contraction of the processes of the cell in which it was diffused, but this supposition was first shewn to be erroneous by Lister (*Op. cit.*) On careful examination we find that the pigment moves from and towards the central portion of the cell quite independent of any change in the form and dimension of the cell and its processes. On the contrary, the movements of the pigment granules appear to be under the influence of a force or forces which reside in the centre of the central part of the cell, while at the same time they take place to a certain extent under the influence of the nervous system. If, for example, the frog be excited by laying hold of it so as to cause it to struggle, the pigment immediately becomes collected in the central part of the cell, and the animal turns pale. Again, if the animal is brought

from a dark place, and exposed to a bright light, the same thing takes place, not, as has been shewn, by the light stimulating the pigment cell directly, but by reflex action, through the medium of the optic nerve. In this case the stimulus of light is conveyed by the optic nerves to the nerve centres, and is thence reflected or sent to the nerves of the skin, and apparently exciting the pigment cells to action, causes concentration of the pigment in the central part of the cell. Concentration of the pigment in any given cell may, besides, be occasioned by gently irritating the part either mechanically or by chemical re-agents. On the other hand, diffusion of the pigment into the processes of the cells appears to take place when the parts are in a state of quiescence, and seem to be caused by the particles having a repellent action on each other, which comes into operation as soon as the attractive force which is seated in the centre of the central portion ceases to be exerted with intensity sufficient to keep the granules together.

Having thus endeavoured to describe as briefly as possible the nature of these pigmentary movements, let us next consider them when a part in which the cells are seated has been irritated to such a degree as to cause inflammation. We have already seen that one result of irritating a part to such an extent as to give rise to inflammation is to cause viscidity of the blood corpuscles, and in this way to hinder the circulation, notwithstanding that the calibre of the vessels is greater than usual. If now we irritate strongly a small portion

of the web of the frog's foot by placing a drop of turpentine or a little mustard on it, we shall find a remarkable difference in the behaviour of those pigment cells which are seated directly under the irritant from those which are situated at a little distance. Let us suppose that at the commencement of the experiment the web is dark, and the pigment consequently diffused throughout the processes of the cells, we shall find that while the pigment still remains in a state of diffusion in those cells which are placed nearest the irritant, it becomes concentrated in those cells which are farther removed from the irritant, and on which the irritant acts with comparative mildness. On continuing to watch the web, it is found that no movements take place in those cells which are situated at the point of irritation. The pigment granules remain in the same state as they were at the moment of the application of the irritant, while surrounding cells which were more gently stimulated, exhibit movements of their molecules as usual.

It may now be asked, what is the cause of the stoppage of the molecular movements in those cells seated at the point of irritation? We have seen that the molecular movements are in all probability caused by a force which resides in the centre of the cell. We are therefore forced to the conclusion that the movements in question are destroyed by the irritant acting so strongly as to paralyse the central force. If the irritation, however, has not been too great nor too long applied, the central force recovers its power, and the pigment again

exhibits its usual movements; at the same time the part begins to swell from the formation of the fibrin and the effusion of serum, and the various signs and symptoms of inflammation ensue. Bearing in mind that what takes place in the pigment cells likewise takes place in all the other cells of the part, we come to the conclusion that the *first stage of inflammation consists in paralysis of the functions of the part;* and it is owing to this that the blood corpuscles which flow through the part become viscid, and stop the circulation, in the same way as they become viscid, and adhere to each other when removed from the vessels, and placed beyond the influence of the vital action of the textures. When the irritation has been so great as to cause *permanent* paralysis of the functions of the part, then mortification or death of the part ensues. When the irritation has been more gentle, the part resumes after a time its functions, but in a disordered manner, so as to give rise to the various phenomena of inflammation. The degree of these subsequent disorders is determined partly by the nature of the part, and partly by the amount of irritation and consequent paralysis of the functions of the part which has taken place. When the irritation has been slight, the reactionary phenomena will, *cæteris paribus*, be correspondingly mild; while, if the irritation has been severe, suppuration, ulceration, etc., will take place, and the structure of the part will be destroyed to a greater or less extent.

When a part has been irritated to such a degree as

to cause temporary paralysis of its functions, it resumes, after a period, longer or shorter according to circumstances, its functions, but, as already mentioned, in a disordered manner. This disordered state of the functions is easily observed in external parts by the latter becoming hot, red, painful, and swollen, so that heat, redness, pain, and swelling have always been regarded as certain signs of inflammation. It must not be forgotten, however, that one or more of these signs may be absent, or when present, as for example in inflammation of internal organs, may be beyond the reach of observation, although the part may be the seat of even severe inflammation. The intensity of these signs varies considerably in inflammation of different parts. Sometimes swelling is the most prominent symptom, as in parts which possess a considerable quantity of loose cellular tissue, viz., the scrotum and eyelids. At other times pain is the most prominent sign, as in inflammation of the pleura, peritoneum, and serous membranes generally ; of the four signs of inflammation, pain is perhaps the most important practically, for in this way attention is directed to the state of the part which would otherwise not have been recognised. This remark not only holds good in medical, but also in veterinary practice, for although the lower animals cannot tell in so many words that they feel pain in any particular place, yet they have various ways of shewing that they feel pain which enable the practitioner to direct his attention to the organ affected. Of course pain of itself does not necessarily indicate that the seat

of it is in a state of inflammation, but when accompanied by other local signs, which will be pointed out in their proper place, and by general constitutional disturbance, it is a reliable sign of the presence of inflammation. The pain varies in its character and in its intensity according to the seat, degree, and stage of the inflammation; cutting or lancinating in inflammation of the serous membranes; dull gnawing in inflammation of the bones; and burning in inflammation of skin and subjacent textures. When pus forms, the pain becomes aggravated and throbbing. It is remarkable that some textures, which in ordinary circumstances possess little or no sensibility, become intensely painful when attacked by inflammation, as is well observed in the fibrous and serous tissues. The cause of this in fibrous textures is in all probability owing to the unyielding nature of the tissue; while in serous membranes we have them, in addition, exposed to a greater or less amount of friction.

With regard to the heat of an inflamed part, it is not so great as it appears to be to the touch. However hot the place may feel, it is never in reality more than two degrees above the ordinary temperature of the blood. The increase of temperature is due to the presence of an unusual quantity, and a more rapid flow of blood through the part than ordinarily obtains; but the principal cause of the elevation of the temperature is owing to the increased vital action, and consequent rapid oxidation of the constituent elements of the part. It follows, therefore, that the more intense the inflam-

mation is, the more heat will there be developed, and the place itself would soon become hotter than it actually is were it not that the greater portion of the heat there formed is quickly carried away by circulating blood.

With reference to redness of an inflamed part, it is due to a much larger quantity of blood being present than in health. Not only is there a larger quantity of blood present in the part owing to the excessive dilatation of the vessels, but the corpuscles, on which the colour of the blood depends, are more densely crowded than usual, and in this way intensify the colour of the blood. In addition to this, the capillaries, owing to the great pressure upon them, generally give way more or less extensively, and the blood becomes extravasated into the tissues. Moreover, vessels which in health would allow only one row of coloured corpuscles to pass through, or which would not admit of any corpuscles at all, enlarge and freely allow crowds of corpuscles to flow through. When the inflammation lasts for some time, new capillary vessels are formed, and in this way the vascularity and consequent redness of the surface are increased.

With regard to the swelling, it is caused by the effusion of serum, and formation of fibrin in the part. It is usual to speak of the fibrin being effused, *i. e.*, effused from the vessels into the tissue of the inflamed part, but it is probably more correct to say that the fibrin is formed *in loco*, the materials for its formation being derived from the blood in the form of albumen. When the fibrin is formed, the swelling consequent on its presence is hard and unyielding, while the parts infil-

trated with serum or the watery portion of the blood, are soft and "pit" on pressure. By pitting is meant, that when the part is pressed by the finger, the impress of the latter remains for a time, owing to the displacement of the serum. The hard portion of the swelling is always the true seat of the inflammation, and occupies the centre. There the pain, redness, and heat, are most intense; while the surrounding soft portion gives rise to little or no disturbance. At first then the inflammatory swelling is divisible into two portions, a defined and comparatively small central hard portion, occupied by fibrin, and an outer soft portion, which is undefined, and gradually passes into the neighbouring healthy textures. Soon, however, pus or matter begins to be formed, and this always takes place in the centre of the hard swelling. On examining this, it is now found to be soft and surrounded by a hard ring—the external portion of the originally uniformly hard swelling. This central soft portion differs from the outer one in its physical as well as in its other characters from the most external soft portion. It is said to fluctuate on pressure, *i.e.*, when the finger of one hand is placed on the swelling, while the finger of the other presses upon it, the fluid pus beneath is felt to yield, and to impinge upon the former. When, therefore, matter has formed in an inflamed part, in other words, in the fully formed abscess, three distinct portions are observable, viz.—1. A central soft fluctuating part; 2. A hard unyielding ring, of greater or less thickness, immediately surrounding it; and, 3. Placed most externally

a soft diffuse swelling, which pits on pressure. After a time, varying according to the acuteness of the inflammation, the central soft portion begins to become elevated at a particular spot—usually the centre—and the abscess is then said to "point." This pointing is the result of the effort which the pus makes to escape from its confined position, and is produced by the pressure of that fluid causing absorption and thinning of the surrounding tissues at one particular point—usually one near the surface—until at last, if the process be not interfered with, an opening is made, through which the pus escapes. When inflammation has been set up in a part it may terminate in one of the following ways :—1. Resolution ; 2. Suppuration ; 3. Ulceration ; 4. Gangrene or Mortification.

1. *Resolution.*—This is the most favourable mode of termination of the inflammatory process, and, accordingly, the one which we should always endeavour to effect. By resolution is meant a return of the part inflamed to its former condition, without any alteration in its structure, and little or no impairment of its functions. As we shall see immediately, this is impossible when suppuration, ulceration, or gangrene takes place. Resolution can take place only when the inflammation is moderate in degree, or if intense, when it is checked at an early stage. When resolution occurs, the fibrin begins to be absorbed, the pain diminishes, the redness becomes less marked, and the heat abates. The vessels assume their usual calibre ; the corpuscles again become slippery, and exhibit no tendency to adhere to each other, or to the

walls of the vessels; at length the swelling totally disappears, and the part resumes its original condition, without impairment of its functions. It is to be remarked, however, that when once a part has been affected with inflammation, no matter whether it has terminated in resolution or in any of the other modes already mentioned, it is very liable, on the occurrence of comparatively trivial causes, to be attacked again.

2. *Suppuration.*—In this process we have the production of a morbid fluid and the destruction of the tissue of the part to a greater or less extent. Pus varies in its appearance, and in other properties, according to circumstances, so that various kinds have been described, which may be classed under the following heads:—1. Laudable; 2. Putrid; 3. Sanious; 4. Scrofulous; 5. Specific.

1. Laudable pus is a creamy, yellowish, bland fluid. It has a "mawkish" taste, and is not corrosive, as was at one time believed. It consists of a clear, watery fluid, called liquor puris, which consists of water holding albumen, pyin, and various inorganic salts, in solution, and of an infinite number of minute microscopic particles, called pus corpuscles, or cells floating in the former, and giving it the consistence and colour which characterise pus. The corpuscles are globular in form, and have an average diameter of $\frac{1}{1000}$ to $\frac{1}{1500}$ of an inch. They present a finely granular appearance, and possess a distinct nucleus, which, however, is not well seen, until on the addition of water, when the cell-wall swells up from the imbibition of the water, and

the granular aspect disappears. Strong acetic acid dissolves the cell wall, and shews the nucleus to be composed of two, three, or more portions. The cells resemble very closely the colourless corpuseles — so closely that the latter have been mistaken for the former. Sometimes the pus cells are more or less angular and shrivelled when the pus is imperfectly developed, as in serofulous subjects. Pus is but little liable to decomposition, and putrefies with difficulty. It is remarkable, however, that there are some parts in which, when pus is developed, it is always putrid, as, for example, in abscess of the gums and of the tonsils. Pus is called sanious, when it is of watery consistence and tinged with blood. Serofulous pus is usually of a watery appearance, but mixed with shreds of tissue and curdy material, and the cells, as above mentioned, are small and angular, and imperfectly developed. Specific pus does not differ in its appearance either microscopically or to the naked eye from laudable pus, and the difference is only recognisable when it is brought in contact with the healthy tissues, when it is seen to possess the power of reproducing itself. As examples, we may mention the pus of gonorrhœa, small-pox, glanders, etc. With regard to the method of the formation of pus, there are only two tissues, according to Virchow, which, as far as is yet known, yield pus; these are areolar or cellular tissue, and epithelial tissue. Areolar tissue is the most universally diffuse of all tissue, and is found not only covering and protecting, but entering between the constituent elements, and forming a part of the

organs. In areolar tissue there are numerous small flattened cells and nuclei, which, when inflammation is set up in the part, rapidly enlarge and multiply by division, so as to produce a great number of nucleated corpuscles, which are the pus corpuscles. When the inflammation occurs on a free surface covered by epithelium, the cells are much more rapidly developed than usual, and instead of becoming converted into flattened scales, are thrown off in the form of globular pus cells, along with the effused serum. Indeed, in stratified epithelium, such as occurs in the mouth, the deeper cells closely resemble pus cells, so that the latter, when formed there, may be regarded as epithelial cells, rapidly, and consequently imperfectly, developed. It is owing to this circumstance that, when mucous membranes are inflamed, they suppurate or yield pus much more readily than when the inflammatory process is set up in any other texture. It will be seen, therefore, that when a part suppurates its structure is more or less destroyed, and the tissue converted into liquid pus. The destruction of tissue is, however, much more marked when ulceration takes place. By ulceration is meant a solution of continuity of the solid textures, by which parts which are naturally covered are exposed to the atmosphere, and from which a greater or less amount of discharge is thrown off. This discharge consists of serum, pus cells, and minute portions of tissue. In short, ulceration may be defined to be molecular death of a part. In this way large portions of tissue are soon destroyed.

Ulceration is apt to take place when the part has been severely injured, and its vitality consequently lowered, or when the general powers of the constitution have been prostrated.

When, however, the injury has been very severe, external gangrene or mortification takes place. By gangrene is meant the death of a part, either in its entirety, or in visible portions of greater or less size. Gangrene may be either primary or secondary. It is primary when it immediately follows, and is caused by the receipt of an injury; secondary, when it occurs as the result of intense inflammation. When it is extensive, or even when it is of small extent, but involves an important part, it gives rise to great constitutional disturbance, depressing the heart's action, and often ending fatally.

When a part dies, it acts as a foreign body to the tissues immediately surrounding it, and, like all foreign bodies, excites inflammation in the living textures. As a result of that inflammation, suppuration takes place, *i.e.*, the solid texture, continuous and in immediate contact with the dead tissue, becomes converted into fluid pus, on which the latter is as it were floated off.

Treatment.—With regard to the treatment of inflammation, we shall here offer only a few general remarks, reserving the more minute consideration to the chapters on inflammation of special organs. The treatment of inflammation divides itself into constitutional and local.

1. The constitutional treatment consists in bleeding

from a vein, and the administration of antiphlogistic remedies. Of the remedies most commonly employed as antiphlogistics may be mentioned antimony, aconite, digitalis, hyoscyamus, opium, mercury, and purgatives. Bleeding was formerly very extensively employed, but is now comparatively less resorted to. It is supposed that bleeding, as a general rule, is apt to do harm instead of good, and when it is at all employed, only a moderate quantity of blood is drawn off. This change in practice is attributed by some, according to their views, to a change of the animal constitution, by which it is rendered more sensitive, and unable to bear the large depletions formerly found to be beneficial. But the quantity of blood necessary to be abstracted cannot be fixed by rules. It must vary according to the nature of the case, and be regulated by the skill and experience of the practitioner. With regard to the local treatment, the first indication is to remove the cause, if it be a local one, and place the part in a state of rest. Unless this be attended to, all treatment must necessarily be abortive. When this has been removed, the application of cold at the first stage often moderates, and sometimes prevents, the process from proceeding further. Should the inflammation advance, however, the application of cold must be exchanged for that of heat. Heat tends to relax the tissues, moderates the pain, and promotes the formation of pus, just as it promotes all cell growth. As soon as matter has formed in the part, it should be allowed free egress by incision with the knife. As soon as this is effected, the symp-

toms usually abate rapidly. The local abstraction of blood, by means of the scarificator and cupping-glasses, is sometimes attended with beneficial effect in the early stage. It acts as a derivative, relieving the over-distended vessels of the inflamed part. Lastly, counter-irritants in the form of blisters, and the actual cautery, must be reckoned among the most efficacious local remedies which we possess. They act indirectly on the inflamed part through the medium of the nervous system, apparently causing contraction of the distended vessels of the inflamed part. At the same time, by exciting an artificial inflammation at the seat of application, they are of benefit, in many cases, in directing the blood from the original seat of the inflammation to the artificial one set up in the skin.

When the inflammation is local, limited in extent, and somewhat external, warm *fomentations,** or *poultices,*† which are a kind of fomentation, or cold

* Clean water is the best FOMENTATION. It should be as hot as the hand can bear it, yet not hot enough to pain the animal. In fomenting the horse, the groom rarely has enough of water, and he does not continue the bathing long enough to do any good. If the leg is to be fomented, get a pailful of water as hot as the hand can bear it; put the horse's foot into it, and with a large sponge lave the water well above the affected part, and keep it constantly running down the whole limb. Foment for about half an hour, and keep the water hot by adding more.

† POULTICES should be formed of those materials which best maintain heat and moisture, and they should be applied as warm as possible, and can be safely borne. They are usually made of bran mash, turnips, or oatmeal porridge. Linseed meal alone makes the best of poultices, and some of it should always be added to the other ingredients. Wet bandages act as poultices.

applications,* may each be applied with advantage, according to circumstances. Fomentations open the pores of the skin, promote perspiration, and so lessen swelling and tension, and assuage pain and inflammation; while cold applications promote evaporation, subdue inordinate action, and so assist in restoring health. When the symptoms are acute, and the disease spreads, as it is prone to do, the whole frame more or less participates, and symptomatic fever is the result.

Concerning the occurence, in the domestic animals, of SYMPTOMATIC FEVER, produced by accident and disease, as injury of the foot, or inflammation of the eye, there can be no doubt whatever. This complaint corresponds in every respect, except its exciting cause, with the SIMPLE INFLAMMATORY FEVER, a disease whose existence has been denied by some, but on very insufficient grounds. "In so plain a point of practice as this," says Mr. Percivall, "we might as well attempt to deny the existence of inflammation in horses as of fever." Its first symptoms, which may not be always easily detected, are dulness and heaviness, hanging down the head, and disinclination to move. This will probably be followed by chilliness, marked by a staring coat, coldness of the surface and extremities, and sometimes an actual rigor or shivering fit: to this succeeds a warm skin, a hot and dry mouth, redness of the eyes and

* Of COOLING LOTIONS cold water is the menstruum. It may be made colder by the introduction of a little salt or ice; sal-ammoniac and vinegar may be added for the same purpose. The object is to reduce heat, and promote evaporation. The addition of a little spirits is made with this object.

lining membrane of the nose, a quick, full, and hard pulse,* rapid respiration, with apparent labour rather than pain; there is also loss of appetite, costiveness, high-coloured and diminished flow of urine, and increased sensibility. The causes most frequently apparent are over-exertion, sudden increase of temperature, and plethora; they are often obscure. The disease appears sometimes as an epidemic, as stated by Mr. Gibson: "I have frequently had several cases of this fever at the same time, and in different places, where no visible cause could be assigned for it." The indications of cure are the same as in symptomatic fever, venesection usually not requiring to be carried far, or often repeated. Returning to symptomatic fever, we remark that the treatment consists in the vigorous employment of what is called the ANTIPHLOGISTIC REGIMEN. Of this the most important item is *blood-letting*, general and local, the former being infinitely the most important.† With

* Of the horse, the natural PULSE is from 35 to 45 beats in the minute; under fever it rises to 80, 90, and 100. The most convenient spot to examine it is at the edge of the lower jaw, a little before the angle, where the maxillary comes from the neck, to be distributed over the face. The pulse is one of the most important indications in all serious disorders.

† BLEEDING. In the horse, and cattle, sheep, and dog, bleeding, from its greater facility and rapidity, is best performed in the jugular or neck vein, though it may also be satisfactorily performed in the *plate* and *saphena* veins, the former coming from the inside of the arm and running up directly in front of it to the jugular; the latter, or thigh vein, running across the inside of that limb. Either the fleam or lancet may be used. When blood is to be drawn, the animal is blindfolded on the side to be operated upon, and the head held to the other side; the hair is

this must be combined purging,* or rather the administration of laxatives, with the object of removing irrita-

smoothed along the course of the vein by the moistened finger, the point selected being about two inches below the angle of the jaw. The progress of the blood towards the heart is to be obstructed, and the vein thus made sufficiently permanent and tense. A large-bladed fleam and a good-sized lancet are preferable, as the benefit of the operation is much increased by the rapidity with which the blood is drawn. From 8 to 12 pints is a moderate bleeding for the horse and ox, regulated in some degree by the size. From 12 to 16, or even 20 pints, is a large one; and sometimes, in skilful hands, it is expedient to bleed till fainting is induced, and the animal drops down under the operation. The vessel in which the blood is received should be such that the quantity can readily be ascertained. When this is sufficient, the edges of the wound are to be brought accurately together, and kept so, by a small sharp pin being passed through them, and retained by a little tow. It is of importance, in closing the wound, to see it is quite close, and that no hairs or other foreign bodies interpose. For a time the head should be tied up, and care taken that the horse does not injure the part.

Local bleeding may be performed in the *palatine* vein, in a line backwards between the middle or central cutting tooth and the second, and a little more than an inch within the teeth. The division is made by means of the bistoury, and the artery as well as the vein is sometimes wounded; hemorrhage, however, may here be readily commanded. In the *foot* it may be performed at the union of the crust and sole, by cutting down with a scarcher or fine drawing knife. For stopping it, a pledget of tow may be applied, and the shoe tacked over it.

* Physicking, which in stable language is the term used for purging, is employed for improving the condition when in indifferent health, and as a remedy for disease. The medicines chiefly used are, for *Horses*, Barbadoes aloes, dose from 3 to 9 drachms, croton *bean*, from a scruple to half a drachm, or *cake*, from half a drachm to a drachm, to which may be occasionally added, calomel, from one drachm to a drachm and a half; for *Cattle*, aloes, in a dose somewhat larger than for the horse, Epsom

tion, and diminishing the watery part of the blood. Large warm injections should at once be resorted to, salts (very uncertain in horses), or common salt, dose from a pound to a pound and a half, with some stimulus, as ginger, anise, or carraway seed; also Linseed oil, dose 1 pound, and croton oil, 15 to 20 drops, or the bean and cake, the same as in the horse. For *Dogs* aloes proves uncertain, and jalap, dose 1 drachm, is far surer, and better when combined with calomel, 2 to 5 grains; croton oil, dose 2 drops, also valuable, and the bean 5 grains, and syrup of buckthorn, dose an ounce. These, it will be observed, are average doses for full-grown animals; in the young and small, they should be less, in the large they may require to be greater; but much injury has often been done by too large doses, too frequently repeated. To the Horse, physic is usually administered in the form of a bolus, or *ball*, to Cattle by drinking or *drenching*, though for both either way may be employed. A ball is conveniently made of linseed meal, molasses, and the active ingredient, whether purgative, diuretic, or cordial; it should be softish, and about the size of a pullet's egg. In administering it, the operator stands before the horse, which is generally unbound, and turned with its head out of the stall, with a halter on it. An assistant stands on the left side, to steady the horse's head, and keep it from rising too high; sometimes he holds the mouth, and grooms generally need such aid. The operator seizes the horse's tongue in his left hand, draws it a little out, and to one side, and places his little finger fast upon the under jaw; with his right hand he carries the ball smartly along the roof of the mouth, and leaves it at the root of the tongue; the mouth is closed, and the head is held, till the ball is seen descending the gullet on the left side. When loath to swallow, a little water may be offered, and it will carry the ball before it. A hot, troublesome horse should be sent at once to a veterinary surgeon. Instruments should if possible be avoided; and adding croton farina to the mash often answers perfectly well. *Drenches*, on the whole, operate more speedily than balls, and are sometimes necessary. As many horses and cattle have been killed by the practice (some of the fluid being forced into the lungs), though heedlessly regarded in stables, and even in books, we advise that becoming caution should be em-

and they are often of signal benefit:* the food must be

ployed, that no unnecessary force he used, that they never he given by the nostrils, and especially that if the slightest irritation is occasioned in the windpipe, the animal shall immediately be set at liberty, that hy coughing he may free himself of the offending matter. Physic is given to a dog hy pouring it over his throat with a spoon, or he may be made to bolt it in a thin slice of meat; the syrup of huckthorn he will often lick spontaneously.

The horse must undergo *preparation for physic*, which is done hy gently relaxing the bowels. During the day previous, his food should he restricted to bran mashes, a quarter of a peck being sufficient for a feed, and this, with his drink, should be given warm; corn should be withheld, and hay restricted. He may have walking or trotting exercise morning and evening. The physic is given on an empty stomach, early in the morning; immediately afterwards a hran-mash is given; that over, the horse goes to exercise, for perhaps an hour, and is watered when he returns. The water should be as warm as he will take it, and he should have as much as he pleases throughout the day; hran mash should be given as often as corn usually is, and better warm than cold; if both are refused, bran may he tried, hut no corn, and but little hay. Sometimes gentle exercise may he given in the afternoon, and also next day. The physic usually hegins to operate next morning, though it rarely takes effect in twelve hours, frequently not for thirty. When the physic begins to operate, the horse should stand in the stable till it *setts*, which may he in twelve hours.

* Injections, though easily administered hy means of the old ox hladder and pipe, are still more conveniently given with a syringe. For laxative clysters for the horse or cow, from a gallon to 12 pints of warm water, or gruel, at the temperature of 96°, with a couple of handfulls of salt, or two ounces of soft soap, prove most useful. Stronger ones may he obtained, by adding a few ounces of aloes to the mixture. In cases of diarrhœa, or over-purging, the injection should consist of a few pints of warm gruel, to which is added an ounce of catechu electuary, or from half a drachm to a drachm of powdered opium. The only art in administering a clyster, where, however, there is often bungling,

regulated and restricted,* and the temperature attended to. *Diaphoretics* may often be employed with advantage,† and associated with them smart friction over the whole body, by wisping and hand-rubbing.‡ When the inflammation is local, warm fomentations or poultices, followed, if necessary, by counter-irritants—should be employed; in acute cases blisters are the most effectual counter-irritants.§

and even injury, by wounding the rectum, is to avoid frightening the animal, anointing the pipe well, and gently insinuating it, before the fluid is forced up.

* In general, bran mashes, carrots, green meat, and hay, form the sick horse's diet, gruel and tepid water his drink.

† Diaphoretics are those medicines which have a tendency to produce perspiration and sweating. Some of these are of a hot and stimulating quality, and these must be avoided in febrile disorders. The others are neither very numerous nor powerful. Emetic tartar, dose from one drachm to two drachms, and foxglove in powder, dose one drachm, are the most powerful. Nitre, in doses of 3 or 4 drachms, is often combined with these. Sulphur, in doses of 4 or 5 ounces, is sometimes useful.

‡ When two men are employed on each side, the effect and benefit are often surprising.

§ Blistering plasters are never applied to horses. An ointment is always used, of which rather more than half is well rubbed into the part to be blistered, while the remainder is thinly and equally spread over the part that has been rubbed. When there is any danger of the ointment running, and acting upon places that should not be blistered, they must be covered with a stiff ointment made of hog's lard and bee's wax, or kept wet with a little water. The bedding must be removed when the leg is blistered, and to prevent the horse slipping, the stones may be covered with a little short litter or saw-dust. The horse's head must be secured in such a way that he cannot reach the blister with his teeth. Put him into a narrow stall, and tie his head firmly to the rack. When the blister has become quite dry, the

As there are no good grounds for denying the existence of Simple Fever, so we are persuaded there are as few for denying the occasional visitation of LOW FEVER, however much it may be generally overlooked. It has been confounded with other grave complaints, but was very generally the essential disease in those murrains which were so common in former days, and which acquired other and most unsatisfactory appellations. It is well observed by an eminent pathologist, that as local inflammation gives rise to constitutional febrile symptoms, so idiopathic fevers of all kinds, in their turn, often give rise to, or at least are accompanied by, local inflammatory symptoms. The old farriers mistook these local symptoms for the fever which produced them, and we fear the error is sometimes committed in our own days. The characteristic symptoms are general disturbance of the circulation, and feeble, rapid pulse, weakness, prostration of strength, determination of blood to particular, but (in different instances and epidemics) very different parts, producing pain, and manifesting a tendency to inflammation, though of a degenerate kind, so that the very texture of the tissue becomes disorganised. The progress of the disease is often rapid, and the result very fatal. In some cases,

head may be freed, and the horse let down. Sometimes it remains itchy, and the horse rubs it; in that case, he must be tied up again. If he get very tired, and threaten to go down on his haunches, put the beads on his neck, let go the head, and give a good bed. When the blister is quite dry, put some sweet oil upon it, and repeat it every second day. Give time, and no work, otherwise the horse may be blemished by the process.

the lungs or heart are attaeked, in others the liver, bowels, or even some external part of the body. This we believe to be the true history of such diseases as the *quarter-evil*, the *black-quarter*, the *joint-felon*, and various *braxies*, which figure so conspicuously in the older works, and whose ravages were attended with such fatal consequences to the agriculturist. In some well-ascertained instanees, nineteen individuals have died out of every score which has been attacked. To the possible reeurrence of such eomplaints, the veterinarian should not shut his eye; and, in actual practice, we have witnessed misehief where these circumstances have been disregarded, and where bleeding, though not excessive, has been pushed too far, with the object of relieving the loeal eomplaint, to the considerable sacrifice of life. In these eases, we have changed the treatment, administered wine and other eordials, instead of debilitating remedies, and thus have arrested the progress of mortality.

About fifteen years ago I was eonsulted by Archibald M'Neill, Esq., regarding the prevalence of Quarter-ill or Black-leg amongst the young cattle in Colonsay, where upwards of 300 were reared every season, and for a great length of time had carried off from 20 to 25 per cent of them.

I was informed that in the end of autumn the young animals were housed, and kept together during the winter in large byres or buildings, which, being rather close, were heated by so many being kept together.

The calves were allowed to suck their mothers until they were taken into the house, when they were chiefly fed on natural hay for the winter, and in the end were allowed a portion of turnips. In a few weeks after they were housed, the disease began, and rapidly carried off great numbers of them—these were always those in the best and most promising condition.

On considering the case, I came to the conclusion that the disease was dependent on a plethora of unsound blood, having a deficiency of fibrin, arising from the sudden change of diet (mother's milk to dry food), and from the open air to a confined and impure atmosphere, caused by the great number of animals being crowded and confined together in an ill-ventilated place. I therefore suggested that a number of sheds or hummocks should be erected, with a yard attached to each, sufficient to accommodate a small number of young cattle together, where they could at all times be sheltered from the weather, and have free access to pure air; that on being brought into the sheds, they should be allowed a proportion of linseed cake, and a considerable supply of turnips daily along with their fodder, which was natural hay. Salt was also to be freely given, with a good supply of water.

These suggestions were carried out with the exception of the linseed, and the consequence was, that the disease entirely subsided, and the stock has ever since continued healthy, not above one or two being attacked in a season, in corroboration of which I subjoin Mr. M'Neill's letter :—

Edinburgh Veterinary College,
30th June 1862.

Dear Sir—In consequence of the conversation I had with you on Friday last, I have made a short note on the cases, and beg to submit them to you to see whether I am correct. I will feel particularly obliged by your looking over it, and favouring me with your remarks at your early convenience. I think it is a subject of sufficient importance to bring before the public, and as you have had such ample opportunities of testing the treatment, I am most anxious to get your recollections on it, lest I should make any mis-statement.—I am, etc.

Archibald M'Neill, Esq.

73 Great King Street,
Edinburgh, 1st July 1862.

Dear Sir—I return your statement as to the treatment of the Quarter-ill at Colonsay, on which I have made one or two small alterations in pencil, and consider it now correct.—Dear sir, yours truly,

Archibald M'Neill.

It has been stated by Mr. M'Gillvary that he has found setons inserted in the dewlap for a time in young cattle almost a complete preventative.

It has also been found, that when the disease takes place in some parts of the country, that by giving a dose or two of salts to all the cattle, and turning them into a very bare field for a few hours daily to ruminate, the disease has at once been checked.

In the study of the veterinary art, the ground-work is Osteology, inasmuch as it relates to the most fixed and stable part of the frame, and so becomes the guide and directory to the relations and actions of all other parts. In accordance with this fact, we shall first direct attention to the Osseous system.

Diseases *of* bones are numerous, but the only ones we need to mention in particular are *Exostosis* and *Necrosis*, under which *Caries*, or ulceration, and *Anchylosis*, may be included. Exostosis is an osseous tumour, originating from a bone, in which the periosteum is always necessarily involved, there being thickening of this membrane, and deposition of osseous matter by it, in many cases, not less than by the bone itself. It may generally be the result of some local injury, though unquestionably it may occur from other causes. There is no bone which it may not attack; and an exostosis, as large as a child's head, has been seen on some of the bones. The attending pain seems to vary, and to be greatly dependent upon the extent to which the circumjacent parts are involved, as does also the degree of lameness it may produce. With a few exceptions, the disease does not often force itself upon notice. The appropriate remedy, very uniform in its beneficial results, is counter-irritation, by frequent, and if necessary, smart blistering, firing, or setons. In some cases, it may finally call for excision. The exceptions just alluded to are the diseases known under the names of *bone-spavin*, *splint*, and *ring-bone*, which no doubt afford specimens of the disease. But it is

moreover true, that, in these instances, other tissues than those named are implicated, and often primarily; so that we shall postpone their consideration. Necrosis is the death, more or less extensive, of the whole or part of a bone. An effort is made by nature to throw it off from the frame, by exfoliation; and it is often wonderful to observe what is effected in this way. The disease is not, however, often witnessed in the lower animals, so we need not dwell longer upon it. Anchylosis, or a bony union of parts of a joint which were naturally free, and played on each other, often occurs, the result of long-continued irritation and inflammation of the parts implicated.

Fractures are not uncommon among domestic animals; although, from the frequent attendant violence, many of them are beyond the reach of art. Thus is it generally with *fracture of the skull*, three peculiar cases of which have fallen under my notice within the last two years—one fracture of the frontal bone, from a blow of a swingle-tree; a second, a fracture of the sphenoid bone, caused by the horse falling on his nose; the third, a fracture of the basilar process of the occiput, owing to the horse, in rearing, falling suddenly backwards on his occiput. All of these necessarily proved fatal. The ridge of the orbit at its centre and upper part is sometimes fractured by a fall, or as more frequently happens by a blow, etc. The crest of the occiput is also sometimes fractured. Sometimes the ridge of the *orbit*, at its outer and upper part, is fractured by falls, and more frequently by blows: the detached por-

tion may be replaced, and retained by stitching the skin, and bandages. The spinal processes of the vertebræ are sometimes fractured, also the body of the bone. Caries or ulceration occasionally occurs in the spinous process of the vertebræ as a result of an injury either from the saddle, the roller, or head-stall, producing fistulous withers or poll-evil. In these cases the part must be freely opened and the diseased bone dressed with diluted hydrochlorie acid, or the diseased part removed by the aid of a fine saw.

Rachitis or rickets is a disease of bone peculiar to young animals. In foals there is sometimes an appearance of it, but they soon get well. It is most frequently met with in young pigs and puppies. This disease is due to a deficiency of earthy matter in the bone, causing them to bend and give way; the remedy is to supply them with food rich in earthy matter, such as bones or phosphate of lime, etc.

Osteosarcoma is another of the diseases of bone occasionally met with, more especially in the bovine tribe: it consists in a tumour partly fleshy and partly bony, and generally attacks the jaws or ribs. Besides these diseases there are others from which our patients are almost exempt, such as mollities ossium, fragilitas ossium, enchondroma, etc. The ribs, too, are subject to fracture, and the sacrum, from falling backwards, when paralysis of the tail occurs. The ossa inominata are very liable to fracture in all their parts, but especially the shaft of the ilium, and through the pubis and ischium. The tuberosity of the ischium is

occasionally broken off, when a flattened part appears at the posterior part of the hip. In cases of fracture of the anterior spinous process of the ilium, it is usually brought about by the horse making a sudden rush into or out of the stable, and striking the projecting part against the side of the door: the symptoms are drooping of the quarter, crepitation, or falling on the haunch, and "down of the hip." The extremities, however, are most liable to this accident, including the femur and tibia, the scapula, humerus, elbow, fore-arm, cannons, pasterns, and coffins. Fracture of the leg occurs on the road or street, the rider or driver not knowing whether the accident has occurred in the fall, after it, or in trying to avoid it. It may be that the fracture is produced by a blow from the opposite foot. When the end of the bone protrudes through the integuments, the fracture is called *compound*, and the prospect of a successful issue is then greatly diminished. It is a great error to suppose that a horse's bone, once broken, cannot unite; it does so as readily as in man. When the attempt is not made, it is on account of the cost and trouble. When an animal is highly valued, the cure may be wisely undertaken, and successfully accomplished, by the application of splints and bandages, the sufferer, if required, being slung. In sheep, fractures heal with great facility; and also in the dog.

On the MYOLOGY, or muscular system of the lower animals, we shall say but little. It consists chiefly of two parts—of what constitutes generally the body or belly of the muscles, popularly called flesh; and of

shining *tendons*, into which these *muscular fibres* are inserted, forming strong but little elastic cords, which are fixed into the bones and other parts which are to be moved or compressed. These tendons generally lie over and round the joints, thereby strengthening them. To these must be added the *aponeuroses*, which are tendinous wrappers or binders, of various thickness, which cover various sets of muscles, and occasionally connect them to each other, and to the bones beneath. These constituent parts of the muscular system, and especially the last, are generally esteemed the seat of RHEUMATISM ; a disease from which the lower animals are not altogether exempt. It is generally produced by sudden exposure to cold and rain, damp and draughts, after being overheated. Sometimes it is general, accompanied with pain, lameness, and great fever : in other cases it is local. One form of the *Chill* of Mr. White, resembles *Rheumatic fever* in man. A few hours after violent exercise, especially if the horse has been plunged into a river, or washed freely with cold water, and then placed in a current of air, it may be found almost incapable of moving, and can scarcely be led out for examination, and this by metastasis may change into *acute founder*. With this there is quick pulse and rapid breathing. The pain may be generally diffused, or local. Sometimes it is confined to the muscles of the chest, when it forms the *chest-founder* of Gibson, and many farriers. The term *anticor* is sometimes applied to this disease affecting the breast, but it is also applied to any uneasiness or swelling of

the part. The disease often falls upon the loins in oxen, constituting the *chine-felon* of older writers, and arising from the same causes as those mentioned above. Sometimes it shews itself at one or more of the joints, forming the *joint-felon*. We have witnessed acute rheumatism in the elbow and stifle, though rarely; also, at the knees and sometimes the hocks: it is common in lambs in cold and wet seasons, and in the horse it frequently attacks the fetlocks, after catarrhal affections. The treatment in all these complaints consists in bleeding, moderate purging, with fomentations and embrocations to the swellings. The disorder called the *Founder* in dogs, is this disease, usually produced by the same class of causes, and requiring the same kind of remedies. In addition to bleeding and purging, hot baths, and a dry and comfortable kennel, with small doses of colchicum and antimony, are the most successful remedies, followed by regular exercise. The claws must be kept short.

Besides the tendons already mentioned, and the accurate fitting of the bones into one another, having their extremities covered with *cartilage*, a substance in firmness and elasticity approximating to caoutchoue, the JOINTS are greatly strengthened by what are properly called *ligaments*, and which consist of strong tendinous cords, passing from bone to bone, and most firmly binding them together. Internal to the cartilages, and lining the cavity of the joint, is a fine vascular membrane, designated the *synovial*, whose office is to secrete the joint-oil: and to finish these details, we have only to add one other fact, namely, that wherever friction

occurs, as of a tendon upon a bone, there is found what is called a *bursa*, which is nothing else than a fine bag, which secretes a lubricating fluid, so facilitating the motion. All these parts, it will be understood, enter directly into the formation of the joints; and when these exquisite structures are considered, and their extreme liability to accidents, it will at once be perceived how complicated and important these injuries and diseases must necessarily be. We now return to the diseases of the bones already named, to which we shall add those of the other parts just mentioned.

After the exposition already given of the pathology of exostosis, the somewhat complicated examples of it to which we now proceed will not occupy us long; and the description of one will nearly serve for the others. Bone Spavin occurs in the lower part of the hock. It is usually observed as a small hard tumour, at the top of the shank bone, and the lower wedge bones. It seems to be produced from stress or over-work, occurring especially in young horses, and at first is commonly attended with pain, occasioning considerable lameness.* The ligaments and cartilages have probably been injured; the periosteum and bone inflame, swell, and throw out ossific matter, and, unless care be taken, the disease spreads to the wedge bones, and to the astragalus, thereby involving the hinge-joint of the hock, a result most anxiously to be avoided. The treatment, which

* Conformation of hock, and hereditary constitution predispose to the disease. Hence breeding from such animals should be avoided.

should commence early, is mainly counter-irritation, by repeated smart blistering, firing, setons, punching, and long rest and ease. Under the treatment specified, many complete cures have been effected, and with no return of the disease. From the want, however, of sufficiently active treatment, and of due patience, only partial relief is very often obtained. The horse is rendered unfit for quick and hard work, and remains spavined for life. The circumstance of the lameness diminishing in the chronic state, under exercise, is explained by the principal seat of motion, between the astragalus and tibia, being free, and the stiffness and pain being felt chiefly in some less important parts of the articulation.*

The SPLINT or *splent* now requires little more for its elucidation than being defined. It acquires its name from its seat, occurring always on one of the splint bones of the leg. A tumour, which feels hard, appears between the knee and fetlock, and generally upon the inside of the leg. Its nature, causes, symptoms, and cure, entirely correspond with those of the last-named disease. The deformity often appears in a chronic state, gives no great trouble, and finally may disappear. RINGBONE has acquired its name from its form, usually shewing itself just above the coronet; it is an exostosis of the pastern bones, often proceeding to

* I have several specimens in my museum, shewing anchylosis of the cuneiform bones of the hock, without enlargement, and without affecting the motion of the joint, or causing lameness, although the horses in the incipient stage of the disease might have been certified as unsound.

anchylosis of the pastern or coffin joints. Though generally commencing at this joint, it is apt to spread, producing anchylosis between the large and small pastern bones, or it may commence in the pastern joint from concussion of the pastern bones, which are occasionally either partially or completely fractured. Ossification of the lateral cartilages is sometimes called Ringbone, but more commonly Sidebones. Ringbone occurs more frequently on the hind than on the fore feet; while ossification of the lateral cartilages occurs more frequently on the fore feet. If sufficient time be not allowed for the active use of means, the whole joint may be involved, and become useless.

ABSCESS, the result of inflammation, more or less acute, is a circumscribed swelling, containing matter in the surrounding cellular membrane, which forms a cyst for containing it, the matter or pus being a product of the inflammation. This pus generally must procure vent for itself, and, as a general principle, in that direction where the resistance is the least. Thus it usually comes to the surface. Often, however, it does not; the abscess bursting in another direction, the matter escapes, and a SINUS, fistula, or PIPE, so designated by farriers, occurs. These sinuses burrow especially among the fasciæ, tendons, joints, and other parts lately alluded to. Abscess may occur in any part of the body; and the object of art ever is to expedite its formation, and to afford a free and speedy evacuation, especially when, from its locality, there is risk of sinus. When sinuses form, they must be freely opened; some-

times by counter-opening to that extent, that the matter shall have the most direct and safest exit. In this connection two complaints require mention. POLL-EVIL is a name derived from its proximity to the head. The cranium is sustained on the neck by the help of *ligamentum nuchæ*, or pack-wax, a broad and strong ligament, possessing a high degree of elasticity. It not unfrequently happens that, from a horse's raising his head violently against the manger, or bruising it with the halter, or from cruel blows of brutal stablemen or carters, an injury is inflicted. To a certain extent it may be superficial; but in addition, from the contusion of the inner surface of the ligament on the bones, inflammation is often excited in the soft parts beneath. Hence the secretion of pus, which could never work its way through the pack-wax; and hence it burrows deep, and in different directions, till serious injury is done far and near, not sparing, sometimes, the bony processes. So soon as the disease is discovered, the treatment is plain, and if judicious, effectual. The probe must be introduced, and openings and counter-openings made freely, but with discretion; and the sinuses, wholly or partially freed, may speedily, by means of stimulants, be induced to assume a healthy action. FISTULA OF THE WITHERS, from the pressure and irritation of the saddle, forms another instance in which these sinuses are apt to run deep and produce much mischief. Hence all injury from this cause requires watching. By pressure we may ascertain the earliest formation of pus; and the abscess should be opened. After sinuses are formed,

the principle of treatment is the same as just specified. Tents, or dossils of lint, put within the lips of the wound, may sometimes be required.

To the BURSA, so generally spread over the body, we have already made allusion; and in turning to their diseased condition we may affirm that this arises almost solely from an increased effusion into their cavity, produced by a strain of the tendon passing over them, or from increased friction in over-exertion, whereby they become enlarged, tense, painful in themselves, and still more by the irritation they produce in the neighbouring parts. Sometimes the swelling is enormous, and it is matter of surprise there is comparatively so little local and constitutional disturbance. These swellings are popularly called WINDGALLS—*Ganglions* in man. Small windgalls may long exist without apparent injury, but they are always unseemly; and when fresh we should endeavour to remove them. Cold evaporating lotions are sometimes tried; but I believe smart counter-irritation, by strong and repeated blisters, is much more likely to be useful. In obstinate cases firing is much practised; and though I believe that, in this and other complaints, this painful remedy has been, and still is, much abused, yet, administered discreetly, it is too valuable a remedy to be discarded. If the firing does not succeed, I advise puncturing the cyst, applying compress and bandage, and healing the external wound, where there is any difficulty, with the help of the actual cautery.* This being the nature and the

* As it is necessary to explain how this may be safely accomplished, we shall say a few words on the proper mode of securing

treatment of windgalls generally, I can speedily dismiss those which, from peculiarity of position and im-

animals. Twitching.—A *twitch* is an instrument composed of a noose of cord, attached to the end of a stick; and twitching consists in fixing the noose on the upper lip of the horse, and twisting it rather tightly. From the great pain it can be made to produce it exercises great control over the animal, and makes it stand quiet. The matter is very simple, and, when required, can be applied in the field as well as in the stable. Casting is the term used for throwing down a horse or bullock, and so keeping it. In the former animal this is done by means of *hobbles*, strong straps and cords particularly arranged, which are first attached to the feet and then suddenly drawn together, so that the animal must fall, the fall being regulated by one man at the head and another at the haunch. Even when most skilfully performed, from the act of falling and the struggles after it, many accidents have occurred to man and horse. In the case of the ox you take a long rope, double it, and tie a knot in the middle about a yard from the end, so as to leave a noose of sufficient size to go round the bullock's neck; which being put on, the two ends are to be brought between the fore legs, and round the hind pasterns, then back again and through the noose. By standing in front of the animal, and drawing up the ropes quickly, so that the hind legs are drawn towards the chest, it is easily thrown down; while in this situation the ropes are to be secured, and any operation may be safely performed. The veterinary surgeon also employs the *side-lines*, *barnacles*, and *trevis*, so much used on the continent; for the particulars concerning which we must refer to the works named at the end of the article.

In Firing, or applying the cautery, casting is a frequent preliminary. The part should previously have been shaven or the hair clipped as short as possible. The operation consists in drawing lines, which had best be parallel, about half an inch asunder, on the affected part, with a red hot iron with a small smooth rounded edge. No part is in a fit state to be fired when the skin is hot or inflamed, and the skin should never be deeply penetrated by the iron. According to the heat of the point, so should be the velocity and lightness of touch, and a brown or yellow marking in the skin from the singeing is all that is required. After

portance, have figured as distinct and peculiar diseases. Bog-Spavin, sometimes called Blood-Spavin—but blood spavin is in reality a varicose vein, which is extremely rare—occurs in nearly the same position as bone-spavin, but higher up, is much softer in its texture, and elastic. Its causes are friction and also the same as those already mentioned. The circumscribed tumour obstructs the return of the blood from the neighbouring veins, which consequently swell; hence the name Blood-Spavin, and hence the unwarrantable practice of removing a part of the vein. This is not a common disease, the symptoms are not acute as in bone-spavin; lameness is seldom observed though it may constitute unsoundness. On the treatment I have nothing to add. Capped Hock

the firing, the horse must be laid up for three or four days to prevent his injuring the part. If the irritation produced is less than was intended, it may be promoted by means of blistering ointment. When it is wished to moderate it or heal it, the treatment is the same as after blistering. Counter-irritation is also effected by means of the seton and the rowel. The Seton consists of a piece of tape or soft cord passed under a portion of the skin by the seton needle; the ends may be tied together, the cord may be moved every other day from side to side, being previously lubricated with oil of turpentine or blister plaster. Thus the amount of irritation may be regulated; and the practice is often resorted to for relieving deep-seated and painful affections. The Rowel is only a seton under another form. In applying it an incision is made in the skin to the extent of about an inch by pinching it up and cutting it with a bistoury or rowel scissors. The cellular membrane round the wound is then separated to the extent of about an inch, so as to admit a dossil of tow, which is better than leather, smeared with digestive ointment. A discharge is soon produced, which has a tendency to relieve any deep-seated neighbouring morbid action.

is named from its position, the back projecting point of the joint. It is usually produced by blows, often inflicted by the horse itself, by kicking in harness, or in the stable. If not speedily dissipated, the tumour is apt to become callous and obstinate. The CURB is another enlargement at the back of the hock, but three or four inches under its projecting point. The complaint is produced by an injury of the ligament which connects the os calcis with the metatarsal bone, and consists of a thickening of the ligament and cellular membrane. It occurs from a sudden sprain, in a race, an extraordinary leap, or severe gallop over heavy ground. The swelling is not great, but at first the complaint is usually attended with lameness. Some horses are termed *curby-hocked*, implying that they labour under a species of malformation, in consequence of which the ligament in question is more liable to be injured than in other hocks. WINDGALLS are very common above the fetlock. They consist of enlarged bursa, but are of little importance, unless hard and distended. THOROUGH-PIN, a swelling both on the out and in side of the hock, is an affection of the bursa at the back part of the joint, with an extra effusion of the lubricating fluid. If the tumour on one side be pressed, the fluid is forced into that of the other side; hence the name. The symptoms arise either from the bursa, surrounding the perforans tendon passing round the back part of the hock, being disturbed, or as an accompaniment of bog-spavin from the capsular ligament itself being involved.

Affections of the Synovial Membranes, when serious in their nature, are almost always the consequence of external injury. When the joints are laid open, especially the larger ones, the danger is great from the inflammatory fever, and the result is often fatal. The wound is sometimes witnessed in the *stifle*, *hock*, *elbow*, and *fetlocks*, but most frequently in the fore *knee*. In the former of these joints it is generally the result of puncture, either accidentally or through brutal usage; the swelling is rapid and extensive, and the attendant inflammation most hazardous. The opening into the knee-joint is the result of coming down, with severe Broken Knee. Under this term is included the slightest division of the skin, as well as the most formidable; and here no injury is trifling. The worst should at once be ascertained by accurate examination. If slight and superficial, the wound may be bathed twice or thrice a day with Goulard's lotion; swelling and inflammation require repeated poultices; any tendency to proud flesh must be repressed with burnt alum, or blue stone. The appearance of synovia at once demonstrates the nature of the accident; and the limb must then be moved as little as possible, as the rubbing of the ends of the bones on each other is most injurious, indeed it is perhaps the best plan to apply splints and bandages to prevent motion. The great object here, as in the case of the other joints, is to endeavour to close the orifice, and if possible to anticipate inflammation and fever; and unless this can be effected the animal must be destroyed. By the careful applica-

tion of plaster, sometimes stitching, applying paste or flour, by skilful bandaging, and complete rest, the puneture has been, and may be healed, at onee. For the same objeet white or blue vitriol is applied, and the cautery is often useful. The synovial membrane itself is not to be eauterised, but the superficial parts. If the first applieation has not been suceessful in the course of a few days, a second may be tried; and five or six applications have at last rewarded the practitioner's skill.

A Sprain, or *strain*, is violence inflicted, with extension, often rupture and displacement, upon the soft parts of a joint, including eellular membrane, tendons, ligaments, and all other parts forming the artieulation. The disloeation or disruption may be eomplete, or it may be a mere bruise or stress; and innumerable are the shades of difference between these extremes. Effusion of the fluids is an attendant eonsequenee. Parts of vital importance, as in the neck or back, may be implieated, and the aceident be immediately fatal or wholly irremediable; on the contrary, they may be to that extent only, that with time and care, restoration may be accomplished. They eonstitute a very serious class of cases. The marked symptoms are pain in the injured parts, and inability of motion, sometimes complete. The treatment is at first rest, a regulation of the loeal action and constitutional disturbanee, according to circumstance, by venesection, general and loeal, the antiphlogistic regimen, fomentation, bandages, and other soothing remedies; and, when the sprain is of an older date, counter-irritation, friction, and gentle exercise.

A sprain of the NECK is commonly the result of a violent fall upon the head, as in hunting, or in a steeple-chase. The spinal cord may be severely injured, and, according to the precise situation, there may be instant death, or hopeless paralysis. In other cases, without serious injury of the cord, there is displacement of some of the bones, with a slight twist of the neck and head. In such a case there may be recovery with permanent distortion. A sprain of the BACK may occur in the field or upon ice. The hind feet slip backward, as in leaping a ditch, and the violent effort the horse makes to recover his footing appears to be the cause of the injury. The bones of the spine may thus be partially separated, or the stress may be so slight as to attract no attention till the horse cools. In aggravated cases art can do nothing; the milder ones must be treated according to the principles already laid down. SPRAIN of the SHOULDER assuredly occurs, though *shoulder-lameness* is often imputed when the disease is totally different; hence the importance of discrimination. It is more frequently produced by a slip or side fall, than by fair and violent exertion. On examination there may be neither distinct heat nor swelling in the part; but there will be unwillingness to move the joint; the animal will extend it and raise the leg as little as possible; there will also be soreness in the articulation on pressure, especially on each side of the tendon of the flexor brachii, where it passes over the head of the humerus, and a peculiar drawing up of the leg. If there be difficulty in coming to a decision from the

symptoms, we must take the limb in hand, and observe if the movements of the shoulder-joint give pain. A mild blister often effects a cure; and the constitution is seldom disturbed. Rest must be secured. Regarding the sprains of the HIP-JOINT, usually called *whirl-bone*, or *round bone*, our remarks would so much correspond to those just delivered, that we shall not repeat them; but the seat of the injury is commonly either the round ligament which may be ruptured, or the tendon of the gluteus maximus; the adjacent bones are also frequently diseased. The ligaments of the STIFLE-JOINT and the HOCK are occasionally sprained, and such accidents are marked by swelling of the part, and dragging of the leg. The PATELLA is sometimes dislocated, and the ligaments torn, when the leg is dragged, rigid, and powerless. The patella should be reduced by drawing the leg forcibly forwards, pressing it into its place. Spasm, or cramp, presents symptoms much resembling those of dislocation, and is frequently mistaken for it; the leg is extended and fixed to the ground, comes on suddenly, and goes off in the same manner. The FETLOCKS and PASTERNS are also subject to sprain, and to be involved in the injury of the *perforating flexor of the foot* and the *suspensary ligament*, which are primarily concerned in BREAKING-DOWN. Two injuries are described under this name. One is merely a *sprain* of the back-tendons, usually in the fore-leg; it may be so slight as to escape notice till the horse cools, or it may be such as to produce marked lameness from the first. The other, or *true breaking-*

down, consists in a *rupture* of the tendons and ligaments: it occurs suddenly, and generally when the horse is at full speed; it rarely happens in both the fore-legs at once. The horse stops instantly, or he falls; on rising he is seen to rest on his fetlocks, the toe turned up, the sole looking forward. Some able writers have denied the possibility of the fracture of the ligament; but the true pathology here regards not one ligament or tendon, but all the parts which form the back parts of the joint. Sometimes they are partially torn. When the fetlock does not wholly come to the ground, the foot, skilfully treated, may become as useful as ever; when both fetlocks come down, the horse can seldom be recovered. This accident sometimes leads to a contraction or drawing up of the leg, which ultimately knuckles over at the fetlock. For the relief of this, the tendons must be cut—an operation proposed upwards of forty years ago by my father, and now coming into general use.

The human hand has been the subject of much and deserved admiration, and the horse's foot is scarcely less an object of wonder. It is also a highly vital and complicated organ, essential to the well-being of the animal, and pre-eminently exposed to injuries. On a minute knowledge of its structure, and the uses of its various parts, depends the successful treatment of its multitudinous and important diseases, which, early and accurately discriminated, may often be speedily remedied, while, mistaken and neglected, they proceed from bad to worse, till the animal is good for nothing.

We here say nothing of WEAKNESS OF THE FOOT, which is rather an original infirmity than a distinct disease, though it leads to many. Animals so formed should never be put to severe and heavy work, for which they are wholly unfit. Neither shall we say much regarding SHOEING—a most important art, on the enlightened and careful practice of which, much of the horse's usefulness depends. The great principle is to afford a good and level bearing, while the nails, in giving sufficient attachment, do not injure the quick. The bearing is to be supplied only to the crust; and the toe especially must be kept short. When there is any tendency in the hoof to contract, the nails in the inner quarter, which is the weaker, should be placed well forward, so as to confine the play of the back part of the foot as little as possible. Sometimes the extremities of the heels are turned up, which is called *calking;* and additional parts are put to the toe, for the purpose of giving purchase in draught; but these additions are unnecessary for the protection of the foot, and only increase the liability to injury and disease. It occasionally happens in shoeing, that a nail may injure the tender parts beneath—an accident which goes under the name of PRICKING, and which is also caused by wounds inflicted on the sole, by broken glass, sharp flints, etc. As soon as the tenderness is perceived, the cause should be most carefully investigated. Hard pressure near the injury may shew that the nail is the cause; when the shoe must be removed, and the part freely pared. What is to be apprehended is

inflammation and suppuration, proceeding to sinuses. Where irritation is considerable, rest, and cold lotions, and a laxative, may be prescribed; when at all threatening, the foot should be enveloped in warm poultices. The disease, somewhat advanced, forms a *whitlow*, which is called PIPES or QUITTOR, in which we find that the sinuses have run deep. It may be in several directions, mounting up to the coronary ligament, causing severe and protracted lameness. The cure may be both painful and tedious, but the principle is clear: free vent must be procured for the matter, all pressure and irritation must be removed, the parts must be soothed by poultices, and the sinuses must be gently stimulated to healthy action, by solutions of white or blue vitriol, or corrosive sublimate. It is sometimes recommended to plug up the sinuses with strong causties, to urge them to assume a healthy instead of a diseased action: the plan may occasionally succeed, but the action is violent, and will often aggravate the disorder it is intended to remove. Mild dressings and rest will complete the cure. CORNS are usually the consequence of the irregular pressure of the shoe on peculiarly formed hoofs. Judging from analogy, these annoyances would be supposed to consist of hard cuticular excrescences pressing on the tender parts beneath; instead of which, they are mere bruises, generally produced by the heel of the shoe, which, from the extravasated blood, assumes a reddish or dark colour. These bruises affecting the sensitive parts beneath do not act otherwise than injuries from other causes. They

usually oeeur only in the fore-feet; their site is almost invariably in the inner quarter, between the bar and erust, at the heel. If they advanee to misehief, it is precisely sueh as has been deseribed under the head of quittor, and must be treated in a similar way.

These injuries, it will be observed, produee inflammation of the internal parts of the foot, whieh somewhat approximates, but yet is different from, that aeute inflammatory affeetion of the parts, whieh is known under the name of ACUTE FOUNDER, and whose primary seat seems to be the laminæ of the eoffin-bone (henee ealled *laminitis*), and the other sensitive parts within the hoof. This disease comes on after great stress and over-exertion, and espeeially when, after the feet have been battered, and the animal over-heated and exhausted, it is exposed to eold and damp. This, however, is not the only eause. We have already seen, when treating of rheumatism, that by something like metastasis, the morbid aetion, moderating in the ehest, assails the parts now under review. Still more eurious is the faet, that when an animal has gorged himself with dry meat, for example at the eorn-bin, if he eseape a disease of the stomaeh, of whieh more anon, this same aeute founder is an oeeasional eonsequenee. Henee, then, though the disease may be eaused by loeal injury, yet the eonstitutional ageney must not be overlooked. The symptoms are sueh as this view suggests. They appear more frequently in the fore than the hind feet; they may attaek the fore-feet only, or all the four. First, there is pain manifested, by a general disinelination to

move, fidgetiness, and an unwillingness to throw the weight on the inflamed feet. The mischief is very readily and unequivocally detected, by pushing the animal backwards; if he winces under this, and is still unwilling to move, it is an unerring indication of the existence of the disease, whether in its mere local or constitutional manifestation. In violent cases, however, the complaint speaks for itself. The foot on examination is perceived to be hot, pain is produced by a slight blow, the neighbouring arteries pulsate violently, the animal cannot stand without difficulty, and will ere long drop down from the violence of the agony, sometimes resting his muzzle on the affected member. With this there is symptomatic fever in its acutest form. The results of the local inflammation need not be detailed, the effusion of serum and formation of pus being substituted for the healthy secretions. The whole crust may be separated from the sensitive foot, leaving the stump bare and exposed; or, if checked, the separation may be partial, or wholly absent, and there may be no greater mischief than, by and by, the appearance of a slight depression, or ring upon the crust. The treatment will be anticipated; it is the antiphlogistic, with an energy commensurate to the violence of the symptoms. The bleeding may be local, though to this we should not attach peculiar importance, further than thereby effecting an opening in the sole, so giving vent to matter, and saving the coronet. Bleeding from the neck is always necessary. The shoes should be removed. In slight cases, the

free applieation of cold should, with the eonstitutional treatment, eommand the symptoms. If the erust has separated, more or less, by suppuration, its bearing edge must be removed as soon as possible, and the weight thrown on the sole to prcvent pumieed feet; and after this, the hoofs may bc rcproduecd in a perfect state. Pumiced Foot is one of thosc diseases which result from aeute founder. In it thc sole becomes flat, or evcn eonvex, thereby allowing the eentral and sensitive parts to press on the ground, to their speedy detrimcnt. The eomplaint appears to arisc from a morbid secretion of thc laminæ, thc result of inflammation, and also of the sole, whereby the eoffin-bonc loses its usual support. This is most apt to occur, if the animal is put to work too soon after the inflammatory attack, and when thc sensitive laminæ have not sufficiently recovered thcir healthy eondition, the crust, moreovcr, bcing apt to curve towards the toe. Sometimes the previous inflammatory aetion is so obscure as not to bc deteetcd, and the defeet in thc horny defenec is the only evidence of its previous existencc. This diseasc is most apt to appear in horses with widc feet, mueh exposcd to hard roads and pavemcnt; its progress is usually stcady, though slow, and many horses are rendered perfeetly useless by it. We should aseribe this in somc degrcc to insufficicnt rcmedies being employed for its cure. What is dcsiderated is timc, perfeet rest, and improvement of thc sccretory organs, by stimulating the coronet to a healthy scerction of crust, and chiefly by supporting thc sole.

CONTRACTION OF THE FOOT. NAVICULAR DISEASE. GROGGINESS. Great has been the pains taken by able veterinarians to elucidate the disease known under the above names, concerning the vast importance of which in this country there is but one opinion. By high authority it has been called "the curse upon all good horse flesh" (though, in passing, we remark it is rather the infliction of man, than of any higher power); and, coinciding with this, is the statement, that the public have sustained greater loss of valuable horse flesh from the havoc of this disease alone, than from all the catalogue of diseases to which the limbs are liable. Unfortunately, however, there is not more uniformity of sentiment concerning the importance, prevalence, general history, and result of this disease, than there is diversity of opinion concerning its pathology; or rather we should say more accurately, its proximate cause. It is universally agreed that the hoof in its healthy and normal state is roundish, and largely endowed with the property of elasticity. When we attach to it an iron shoe, this natural play is impeded; and that this result of domesticity has much to do with the disease, some way or other, is universally allowed; the complaint being unknown among horses in their natural state, and nearly so in other countries where they are as much esteemed and used as in our own. How then, and to what extent, does this shoeing operate? Some contend that the contraction of the crust, thus produced, is the true origin of the evil; that this fetters the sensitive parts within; that the sole becomes externally

eoncave, internally eonvex; that the soft elastie parts are absorbed; that the bars beeome the roek of danger; the capsular membrane of the navicular joint is injured; in a word, that "the navieular-joint disease is the general seat of the ehronie lameness of the foot." Many years ago, I took a very prominent part in this eontroversy, and endeavoured to demonstrate that the primary and permanent disease is established in the synovial capsule, between the tendon and navicular bone, and arises generally from strain and over-extension of the tendon, where it passes under the navicular bone. More recent and able writers have since contended that "the inflammation of the little plates eovering the coffin bone is the most usual cause;" and that a degree of inflammation, inferior to that causing acute founder, produces all the sad results. It would be tedious to mention all the discordant opinions which, with much ingenuity, have been promulgated upon the point; but we still believe that the injury of the tendon in the synovial capsule of the navieular joint is most generally the primary and proximate cause, though we do not contend it must be the only cause. Mr. Turner, again, thinks that the hardened sole is the roek on which most valuable horses strike; but he allows it is not the only one; and so it is with other speculations. Why, then, appear to differ, when substantially we agree? Not that we are here arguing for eoncession which will compromise the truth; but we hold that the united persevering ingenuity of scientific men has fully illustrated the nature of this

disease; that it has predisposing causes, such as want of paring, shoeing, and still more bad shoeing, hereditary tendency of particular breeds, and high condition; for it is a disease rarely of the agricultural, but of the high-bred horse. In like manner, it has manifest exciting causes, such as strain of the tendon,* and over-exertion, pressure on the sole, as from travelling with a stone in the foot; and there is the tight shoe exciting irritation of the foot, which, hot and uneasy in the stable, is aggravated by occasional and violent exercise, until the capsular membrane, tendon, laminæ, cartilage, and bone, one after another, and together, are involved in a degree of subacute and inveterate disorder, which has given too much occasion to all the hard things which have been said against it. The symptoms of the early, and, in a practical point of view, the most important stage of the disease, are a peculiar

* Since publishing the first edition of this work, I have met with two cases which illustrate the true nature of the disease; the first, an old carriage horse, which I had long known, suddenly became lame. I was called to examine him, and pronounced it to be a case of injury of the tendon, as it passed over the navicular bone, and that he was not likely to recover. He was kept about five weeks, when, being no better, he was destroyed; and on dissection, I found a laceration of the tendon, without any other lesion in the bursa, or disease of the bone. I have the preparation in my museum. The other, a horse belonging to the late Mr. Wordsworth, had been lame for several weeks; he was attacked with tetanus, and died. On dissecting the foot I found the tendon lacerated on its surface opposed to the navicular bone, but the bone and all the rest of the bursa quite healthy. The preparation is also preserved in my museum.

shifting of the feet, and shortness of the step; while a degree of heat is found in the foot, more especially about the heel and coronet. There is a continued pointing, or holding the foot in a relaxed position; dryness of the hoof, throbbing of the pastern arteries, and pain on pressure, in the hollow of the pastern. The other parts of the limb are clean and fine; there is general tenderness of the foot on pressure, with tripping and stumbling; finally, the foot is contracted. In the treatment, all possible attention must be paid to the shoeing; the sole should be thinned, the bars pretty freely removed, and the toe made short. The other predisposing causes must, as far as possible, be removed; and the exciting, especially the over-tasking, often so inconsiderately and cruelly, the generous nature of our noble steeds, whose dashing, rapid, and firm action, is so frequent a cause of all the mischief. Finally, the proximate cause must be combated, not by clips on the heels, or screws, or jointed shoes, but according to the principles laid down for the relieving of irritation and inflammation; cooling diet, laxatives, shortening the toe of the hoof, thinning the sole, removing the bars to prevent pressure on the seat of the disease, at the same time protecting the parts by leather soles, and stopping with tar or tow, blistering, supplying due moisture to the hoof,* and turning out. Time, and skill, and care, may thus do much.

* Tow, moss, cow dung mixed with clay to give it consistence, and Cherry's felt pads, are the best materials for Stopping. Clay alone is apt to get too hard, though it may answer for great heavy

The foot and leg of the horse are liable to various external injuries, some of which are inflicted by the one limb wounding the other. CUTTING, BRUSHING, INTERFERING, are said to take place, when the one foot strikes and wounds the opposite fetlock; and they usually occur in young and timid horses with ill-formed legs. The habit requires either a particular form of shoe, with which the shoeing smith is familiar, or so putting on the shoe that the crust will project beyond it. A boot is sometimes required. The SPEEDY-CUT is an injury of the same kind, where the leg is struck higher up, and when the horse is going fast. In these cases the leg must be covered with a boot. In the OVERREACH the wound or bruise is produced on the heel of the fore-foot by the hind one in travelling. The TREAD is the same kind of injury upon the coronet of the hind foot, either by the tread of another horse, as often happens in cavalry regiments, or by a false step of the other limb. The Overreach is the consequence only of fast paces. A semi-circular wound is made; the skin being raised like a flap, which folds backwards and downwards. The injury is done not by the toe, but by the edge of the inner rim of the shoe. Sometimes a part of the skin is quite scooped out. These injuries should not be disregarded, for if neglected they produce Quittor. All that is usually

horses, whose work is slow, and whose heels are raised from the ground by high calkins. Tow and moss, after filling the sole, must be packed a little under the shoe, and can be wetted as required. Where the hoofs are naturally weak and brittle, they require additional or more frequent softening.

required is to wash the wound well, put into it a pledgit of tow dipped in Friar's balsam, and bind it up with a bandage. If the cure is not at once effected, and a slough forms, the disease is called a CORE, and requires for its cure only a continuation of the same remedies, with poultices.

One of the functions of the coronary ligament is to secrete the matter answering to the nail in man, which goes to form the crust or external wall of the hoof in animals. When a part of this band has been wounded or injured by disease, it can no longer perform its functions aright, and hence the disease called FALSE-QUARTER. It appears in very different degrees, sometimes forming quite a cleft or fissure, and sometimes exhibiting in the diseased part only a somewhat modified and inferior kind of horn. The secretion is, in short, to different extents deficient and irregular, which exposes to farther injury, is accompanied with more or less tenderness, making the part incapable of bearing the pressure of the shoe, and often causing lameness. The primary attention in the treatment must be given to the diseased coronary band, removing as far as possible the cause, by careful paring, protecting and cherishing it, sometimes with digestives, sometimes by blistering. The fissure should generally be filled with some mild ointment, or with tar hot, or gutta-percha, as dressing, bound on by a coarse tape, and covered with a coating of pitch or tar. When the animal is kept at work, the shoe should be so applied that the pressure be not imposed on the diseased part. A SAND-

Crack is also a fissure of the crust, and differs principally in this, that it does not necessarily proceed from a previous injury or known disease of the coronary band. It may happen in an instant, from a false step; and hence a horse, though he may spring a sand-crack within an hour after purchase, cannot be returned on that account to the seller. Into this crack, or perpendicular division of the hoof, the sand or dirt enters. It occurs in both fore and hind feet, and in the former usually in the inner quarter, in the latter, in front, the principal stress being there; it arises from dryness and brittleness of the crust; sometimes it does not penetrate through the crust, and then it causes no lameness. It must not, however, on that account be neglected. It should be carefully rasped out, and treated as advised under the last-named disease, the shoe being so modelled as not to press upon the crust under the crack. Firing may be occasionally necessary. When it penetrates to the quick, pain and lameness ensue, and fungous growth may appear, which must be removed by opening out the fissure, and by stimulants or escharotics, after the inflammation has subsided. The sole should be kept sufficiently moist, the hoof occasionally pared, and the horse turned to grass. The crack will, with time, recede from the coronet, till at length it totally disappear.

The Thrush or *Frush* primarily attacks the frog, and appears to arise from the continued application of moisture, dirt, and other irritating matters, as in young horses going in a straw yard amongst dung, etc., though

it is sometimes supposed to owe its origin to a wound of the frog, or a contraction of the hoof, whence it proceeds to the external parts. Horses of all ages, and even the unshod colt, and in all situations, are subject to the disease, and it appears more frequently in the hind feet than the fore. Among its first symptoms is a discharge of offensive matter proceeding from the cleft, and gradually pervading the whole frog. If neglected, the entire foot may become involved. The sooner, therefore, that the primary disease is cured the better; and cleanliness and astringents are the appropriate remedies. After being thoroughly cleaned out, the excavation may be filled with calomel, which is almost a specific cure; or with pledgets of tow dipped in warm tar, or some escharotic wash, every night, and retained sometimes during the day. The general health should be attended to, and exercise not neglected. The term SEEDY-TOE has been applied to a chronic form of softening and local irritation, which, beginning between the crust and sole, gradually spreads round the foot. It seems to be aggravated, if it be not sometimes occasioned, by mire and gravel insinuating itself into the altered texture of the edge of the sole: sometimes inflammation of the sensitive parts beneath is assigned as the cause. The treatment is the same as that of the complaints with which it is associated.

CANKER is usually a mere extension and aggravated form of the preceding diseases, from want of care and attention, though sometimes it follows other injuries. The sensible frog, or other parts, instead of secreting

horn, produces a fungous growth which pervades the whole sole, and ultimately extends to the entire secreting surface of the foot. It is most commonly seen in, and is almost peculiar to, the heavy breed of cart-horse, which is often peculiarly exposed to the exciting causes; and sometimes, it would seem, there is a strong hereditary predisposition. Those with white feet are most liable to attack, and the hind feet more than the fore. After it has existed for some time, the disease is difficult of cure. The principle on which the cure must be conducted, is the removal of the diseased sole and fungous growths, so giving free vent to the morbid discharge, by means of the knife and escharotics; lunar caustic, and caustic potash likewise being often highly useful; and this effected, astringents, escharotics, and pressure, are to be employed. M. Feron regarded tar and sulphuric acid, in the proportion of four ounces of the former to two drachms of the latter, as a specific. Cleanliness, perseverance, and time, will effect a cure; but with a dressing of tar, in which verdigris and nitric acid, 2 drachms of each to 1 lb. of tar, are well mixed, and applied with a degree of *firm pressure*, at least every second day, the worst cases may be got well.

Foul of Foot in cattle resembles the diseases we have just been describing in the horse, and in fact is nearly identical with them. Sometimes there is a conspicuous crack between the claws of the hoof, followed by inflammation and secretion of offensive matter; and at other times a tumour appears above the coronet, between the hair and hoof, attended with pain and in-

flammation: sometimes the mischief is owing to foreign bodies finding a lodgment about the hoof. The remedy for this complaint is removal of such foreign bodies, simple ablution, astringent washes, as of alum, sugar of lead, and white vitriol, and dressings with some stimulant, among which equal parts of soft soap and turpentine have been much commended. According to Mr. Skellet, three or four dressings never fail to produce a cure. It is alleged the constitution sometimes participates in the disease, if it does not produce it. We have great doubt of this. The murrain, which has lately visited us, is evidently Epizootic; it gives rise to a form of foot-rot, leading to a partial or complete separation or casting of the hoof. In these cases cleanliness, bleeding, a laxative, and sometimes poultices, with paring of the hoofs, may be required. Foot-Rot is the name given to this kind of disease as exhibited in sheep, among which it commits such disastrous and ruinous consequences, attacking, if neglected, the whole flock, so that in feeding they actually crawl on their knees, before they become its victims. Hence it is regarded in the last degree contagious. After a good deal of investigation, however, we have arrived at a different conclusion; and we discover in its history nothing more than the results of that domestic state to which we have subjected this useful creature. By nature, not unlike the goat, it frequents the summits of the lofty mountains, where its hoofs, altogether analogous to those of the horse, are exposed to much tear and wear. When from these

alpine regions we transfer the sheep into our grassy lawns, our moorish lands, or sandy soils, this wearing away of the crust is put an end to; it grows long, and proves a great encumbrance. In this state it is exposed to many injuries, among others from the long grass of the pastures, and itself necessarily injures the soft parts beneath; and hence lameness, inflammation, suppuration, to the extent of casting the hoof, are the consequences. I have not here space fully to prosecute discussion, and must therefore take the liberty of referring to another quarter for my more extended views of the subject.* The circumstance of the disease occuring epidemically arises, we conceive, from the whole flock being placed in precisely similar circumstances. The symptoms of the disease are quite analogous to those so largely dwelt upon in the horse; and we would insist upon prevention rather than cure. We advise the providing the flocks with regular walks similar to their natural ones; or that they should be made to walk on the hard road, or to be put regularly into a fold with a hard and gravelly bottom. Long rough grasses should be cut down in their pastures. Regarding the treatment, suffice it to say, that the principal points to be attended to, are paring away the detached hoof, and dressing the surface with some caustic, of which butter of antimony is the best. We have lately seen several llamas which were becoming affected in the same manner as sheep, and from the same cause.

* Quarterly Journal of Agriculture, vol. ii. p. 852.

Leg Evil, or Black Leg, is a term much, but not very definitely, used among shepherds, for various disorders of the limb, some of which are sufficiently formidable. One of them begins at the hoof or knee, and soon makes the animal quite lame. The part is covered with small blisters filled with a dark-coloured fluid, and the skin now breaks out in sores. The complaint is said to be highly contagious, and separation accordingly is enjoined between the sound and unsound. The wool is to be removed from the diseased part, the sores, after being well washed, are to be dusted with burnt alum, and the whole limb to be wrapped in a cloth spread with Turner's or a more stimulating cerate. Another disease, which also goes under this name, is a chronic rheumatic affection, now in one limb and now in another. The joints become stiff and somewhat swelled, and the lameness is obstinate; but the disease, although tedious, is not fatal. A third disease corresponds to quarter-ill in cattle.

Leaving the all-important organs of movement, I proceed to the internal parts, and commence with the Digestive System. We begin with the Teeth. The history of the dental apparatus furnishes the most specific evidence regarding the age of the individual, especially in early life; and hence the importance of minute acquaintance with the following particulars respecting the horse. The foal at birth has no teeth; but in a few days, two above and two below, the central, make their appearance, and soon after four others, on the sides of these; in three or four months

more, other four, the *corner* teeth, as they are called, appear. These twelve in front of the mouth continue without alteration until the colt is about two and a half years old, when he begins to shed his teeth. The two central teeth above and below are the first that fall out, and the new teeth, called also horses' teeth, are much larger and stronger than the former. Between the third and fourth year the next incisors above and below fall out, and are replaced in like manner; and between the fourth and fifth year the corner teeth are changed. When the animal is about a year old, four molars appear in each side of each jaw, and when about eighteen months, a fifth. At the age of two and a half, the first temporary molar drops out, and a permanent one takes its place; at three and a half the second, and at four and a half the third. About this time the sixth and last molar appears, and is a permanent tooth. During the fourth year the tusks or tushes appear. The change which takes place between the fifth and sixth year, is the gradual wearing down of the outer edge to a level with the inner. At seven the outer incisors have become a little longer, and the black mark smaller; at eight the mark is generally lost. After this period, a judgment is to be formed by the cavities in the upper teeth. About ten, the central teeth have lost their marks, the two next have but little left, though they are still readily seen in the upper corner ones; by the twelfth year they too have disappeared. The tushes, like the incisors, gradually change their form. At first they are small, sharp, and

shell-like, with a concavity on their inner surface; the teeth become gradually larger, and the concavities less, and at about the age of eight they are nearly lost. About twelve, the inside of the tusk becomes somewhat rounded in form, and ere long is quite round, blunt at top, and of a yellow colour. This colour, with advancing years, pervades all the teeth. The age of the ox and sheep, in their earlier years, is ascertained by a similar acquaintance with the changes of their dental apparatus; in later years from their horns, a year being allowed for every ring, answering to the shedding of their coat; and three additional in the ox, for the space between the oldest ring and the tip.

The Diseases of the Teeth attracting attention are but few. The edges of the grinders, at all ages, are apt to get rough, wounding the inside of the cheek, and so interfering with mastication. These asperities must be filed down with the rasp. Not unfrequently the growth, especially of the grinders, is irregular; a process of one of them often projects, injures the opposite jaw, and interferes with the proper discharge of their functions. The cure is to reduce this tooth to the level of the others by means of the rasp, forceps, or chisel, or, if loose, to remove it.

Proceeding to the Mouth, we remark, that its lining membrane, including the tongue, is apt to be affected with Aphthous Thrush, a crop of small vesicles or pustules, which may go on to ulceration. This would appear to be a disease of the mucous follicles, and requires the greater attention, as it is

sometimes associated with strangles. These symptoms are seen in the horse, but more frequently in cattle, and sheep, and swine, commencing with small blisters, and the peeling off of the cuticle of the tongue and mouth, whereby much difficulty is experienced in taking food; and fever is sometimes present. The murrain, which has within these few years visited us, chiefly affects the animals in this manner, but the teats and the interdigital spaces are also affected. It is a species of herpes or eczema, like the blisters on our lips from cold. In these cases, laxatives, antacids, such as chalk, and diaphoretics, should be prescribed, and an astringent wash to the parts, as of borax and alum. LAMPAS is often described as a painful swelling of the lower bars of the palate, projecting above the surface of the front teeth, and interfering with feeding, being a disease of young horses, connected with the shedding of their teeth, and occasioning fever. It is not, however, so much a disease, as a natural and salutary process, which, in general, is best let alone, and in which cruel remedies, such as firing, should never for a moment be thought of.

The TONGUE is liable to various injuries. Frequent trouble is given in all the domestic animals, from the lodgment of sharp irritating substances about the tongue, throat, and teeth. The offending body may be a needle, thorn, or sharp bone; and in consequence, the animal declines his food, appears sick, and may froth at the mouth; so that in the dog we have known this accident mistaken for *rabies*. In cases of this

sort, the parts should be carefully examined, and on the removal of the offending body, the eure is readily aecomplished. Inflammation of the tongue oceurs spontaneously in the lower animals, as sometimes in man; but is more frequently seen as the result of aecident. Awkwardness and violenee in administering balls and drenches are frequent eauses; and the horse sometimes severely bites his tongue. From the violenee used in administering physic, we have seen the inflammation run so high, as to terminate in gangrene. The disease is eharaeterised by great swelling and prolongation of the organ, thereby impeding breathing. Free bleeding from the part, by searifieation by a sharp knife, and general bleeding, are the most efficient remedies, and sometimes a part of the organ must be cut off. If only a couple of inches are removed, no alteration is produced in feeding; but if double or more be removed, the animal cannot drink till it get its nose under water, when it can produee a vacuum, and employ suetion. From the same kind of rough handling, the frænum is often torn, so oeeasioning ulceration and soreness; but with mild dressing, the sore soon heals. Sometimes we have seen the injury so extensive, that amputation of a part of the member beeame necessary. The hemorrhage from excision is seldom troublesome. The Blain, as originally described in cattle, consisted, we believe, in an obstruetion of the ducts of the sublingual glands, whereby the saliva was confined, occasioning a tumour at the root of the tongue, which produced protrusion of that member,

and threatened suffocation. This disease is likewise known in man as Ranulæ. All that is required is to make a free opening with the lancet. By an extension of the term, the name is applied to the occurrence of vesicles, or small blisters in this locality, which pervade the frænum and the gum. They occur in the horse as well as in cattle, sheep, and swine, going on to troublesome and protracted inflammation, sometimes threatening mortification. Scarification may be used, and strong solutions of alum and borax, with tincture of myrrh, and Friar's balsam.

The Parotid is the most important of the salivary glands, largely secreting this important fluid, and pouring it, through its duct, into the mouth. With the situation of the gland, and the course and termination of the duct, every veterinarian must be familiar, that he may avoid injuring them, and be able to heal them —no easy task, when they have been divided. The principle of cure is sufficiently evident. In the case of the duct, it is to bring the divided ends as closely together as possible, and to keep them there, at the same time preventing the escape of any saliva from the wound. This may be tried by the skilful application of a fine pin, scarifying the edges, if fistulous, and keeping the integuments closely approximated. To rouse these parts to the adhesive inflammation, the cautery is sometimes used; but we have found a strong solution of corrosive sublimate (ten grains to the ounce), more efficacious. If we fail in this method of cure, an artificial opening or canal, as much as possible in the

natural course, must be made between the divided part and the mouth; and when this is thoroughly established, we must connect with it the part of the duct coming from the gland, healing up the superficial parts. Concretions sometimes occur in the duct. We have seen them occasionally as large as marbles, rattling in the cheek like dice. If troublesome, and requiring to be removed, this must be effected from the inside of the cheek, or if from the outside, the wound must be closed very carefully with a pin, as in bleeding. In certain cases of cold and sore throat, the gland inflames and swells, becoming conspicuous, when it forms Mumps; as do also the other salivary glands, especially the submaxillary, constituting what farriers call Vives. For these complaints cruel modes of treatment used to be adopted, which happily are abandoned. Reduced feeding, possibly bleeding, blistering, and time, are all that are required. Sometimes these glands become involved with others, in strangles, when they will again come under notice.

Concerning the Œsophagus, to which I next proceed, the only complaint to which I shall allude at present is that of Obstruction. This may arise from tumours or a pouch and scirrhus, to which I may subsequently advert; now I shall insist only on what is called Choking, or obstruction of the passage by a large morsel of food, witnessed more in cattle than in horses, and most frequently when they are feeding upon turnips, potatoes, carrots, and such like. The obstruction usually occurs at the bottom of the pharynx and commence-

ment of the gullet, not far from the lower part of the larynx, which I have seen mistaken for the foreign body. The accident is much more serious in ruminating animals than in others, as it immediately induces a suspension of that necessary process, and of digestion, followed by a fermentation of the food, the evolution of gases, and all those frightful symptoms, which will be noticed under the disease *Hoven*. The difficulty in breathing, and the general uneasiness of the animal, usually direct at once to the nature of the accident, which examination brings under the cognizance of the eye and hand. No time must be lost in endeavouring to afford relief; and the first thing to be tried is, by gentle friction, and pressure of the hands upwards or downwards, to see and rid the animal of the morsel. Failing in this, I mention first, the great virtue I have frequently found in the use of mild lubricating fluids, such as warm water and oil, well-boiled gruel, etc. The gruel is grateful to the animal, which freely tries to gulp it, and often succeeds. Whether this is owing to the lubrication of the parts, or to the natural action superinduced, it is unnecessary to inquire; but the fact I know, that a few pints of warm gruel have often proved successful in removing the obstruction. If this remedy should be ineffectual, the foreign body may perhaps be within the reach of the small hand which a kind dairymaid may skilfully lend for the purpose. If this good service cannot be procured, the common probang must be used, the cup-end being employed. Other and more complicated instruments, acting

upon various prineiples, have been invented, for example, the serew probang, for extraeting the obstructing body: the use of these requires considerable skill. Disappointed in all, we must finally have recourse to the knife. I have eut into the œsophagus in the horse, merely twitching, without casting him, and extraeted the foreign body with facility. Great eare is afterwards requisite, as the gullet does not always very readily unite, and death sometimes follows. The best treatment, I am persuaded, eonsists in applying a stiteh or two of the interrupted suture, of fine eatgut, so closing the divided parietes of the gullet, and healing the external wound at once by the first intention; the cure is promoted by the applieation of a earefully-graduated pad and bandage. The food must be spare and soft.

In passing to the Abdominal Viscera, I shall premise a short aeeount of *crib-biting* and *wind-sucking;* praetices whieh are said to increase the tendeney to indigestion and colic, and to lower condition, rendering animals that are so affected unsound. A Crib-biter derives his name from seizing the manger, or some other fixture, with his teeth, arehing his neek, and sueking in a quantity of air, with a peculiar noise. After a time the abdomen is evidently enlarged. The habit is most eommon in young horses, but is infectious, and unless the offender is sceluded, spreads widely. The best remedy is a muzzle made for the purpose. It eonsists of an iron raek, so wide as to allow the horse to seize his food, and yet so narrow as

not to permit the passage of the teeth ; and this should be applied so long as the practice is persisted in. The strap round the throat is in common use. WIND-SUCKING consists in swallowing air, without fixing the mouth. The horse presses his lip against some hard body, or extends his head, arching his neck, and gathering together his feet. It may be prevented by applying the strap, which, when studded with one or more sharp points or prickles, opposite the lower part of the jaw, effectually prevents the animal's assuming the position in which he sucks in air.

COSTIVENESS, a complaint to which, from the great changes in their feeding, all the domestic animals are peculiarly liable, is interesting not only on its own account, but also as leading to other and more dangerous disorders. Calves are very subject to it, when first put on dry meat ; and it is highly necessary they should speedily be relieved by a little linseed oil, as colic and enteritis are the frequent consequences. In the horse it is very apt to occur from eating old luxuriant grass ; and it is then occasioned by the felting together of the woody fibre, whose length interferes with its division, so that it accumulates in great masses. This is most apt to occur in the rectum, and to an extent not to be overcome by the most strenuous efforts of unassisted nature. The same state is also seen in dogs. Hence the manual assistance which from time immemorial has been rendered by the farrier, under the name of RAKING and BACK-RAKING, introducing the hand or finger into the rectum, and emptying its contents. In some cases this

is imperiously required; but in many I conceive the practice might well give place to the use of injections with the help of the syringe. In proceeding to afford relief by physic, some preparatory care is necessary, concerning which I refer to a former page. The bowels once cleared, the tendency should be met, and counteracted, by appropriate food.—In connection with this, I may mention, that several cases have occurred to me where the bad health of horses seemed owing to Acidity in the Stomach. In these, the appetite was lost and vitiated, so that old lime and dirt were preferred to wholesome food. The animal was dull, the coat staring, with a tendency to perspiration, the pulse being natural. Loss of the cud in cattle and sheep, sometimes arises from the same cause. Having noticed the craving for lime, I prescribed magnesia, or carbonate of soda, and found great and immediate benefit, so that the practice, I conceive, merits more extensive trial.

That there are cases of pure Spasm or Cramp of the Stomach and Intestines, can admit of no reasonable doubt, although they may often be overlooked and misunderstood. In the horse, it is said to occur most frequently in the ilium. It comes on suddenly, and the pain in the part is intense. The animal shifts his posture, looks at his flank, paws violently, strikes his belly with his feet, lies down and rolls about. In a few minutes the pain ceases, and the horse shakes himself, and begins to feed; but, on a sudden, the spasm returns, with the painful symptoms; ere long there

may be another remission, to be followed by another paroxysm, till it terminate in permanent relief or violent inflammation of the parts. Among the most common causes of this complaint are, the drinking of cold water when the animal is heated, sudden exposure, under such circumstances, to cold and damp, mechanical obstruction, especially from foreign bodies, and over-feeding upon green meat. The distinguishing symptoms between colic and inflammation, into which it is so prone to run, are, that in the former there is no previous cold fit, the pulse is comparatively little affected, there are intervals of relief, and pressure on the abdomen does not aggravate the suffering, but relieves it. The treatment must be prompt, and it consists in the immediate administration of anti-spasmodics, of which laudanum and turpentine are among the most powerful. An ounce or two of laudanum, and three ounces of turpentine, in a pint of linseed oil, often afford instant relief. If we are disappointed in this result, venesection should be immediately practised, as bleeding is the most powerful of all antispasmodics; fomentations, or smart counter-irritation, should be applied to the abdomen; large warm injections prescribed, and laxative medicine; soft meat alone should be permitted; the horse should be kept comfortably warm, and have gentle exercise for a day or two.

The food, after being subjected to the process of mastication, passes into the stomach, where it should undergo the still more important one of *Digestion.* This is chiefly effected by the agency of a peculiar

seeretion of the organ ealled the gastrie juiee, whieh possesses a solvent power superior to that of any other in nature with which we are aequainted. Even if meat be tainted, it eorreets that taint, and when the ingesta have a strong tendeney to aeidity or fermentation, it arrests or suspends that tendeney. This oeeurs in man, and in the lower animals ; though many aeeidents are apt to interfere with its healthy exereise, these varying with their varying strueture and habits. The stomaeh of the horse is small, and ineapable of eontaining mueh at a time, so that the food soon passes off. The stomaeh of the ox and other ruminants is eomplieated, the food passing from poueh to poueh, until the proeess of digestion is eompleted. Whatever interferes with the healthy diseharge of this funetion will naturally lead to Indigestion, whieh, in the lower animals, unlike to what oeeurs in man, leads direetly to disease of the most rapid and fatal eharaeter. Of the predisposing eauses—to turn first to the horse—one of the most influential is any thing whieh interferes with mastieation. Henee the prejudieial effeet of eating too fast, whereby there is a defieieney of the eomminuting proeess, and a paueity of saliva, and henee the evil of the dental apparatus being impeded in its play. Another, and if taken singly, perhaps the most important cause, is a surfeit, overloading the stomaeh with more than it ean manage, espeeially after a long and fatiguing fast, exhausting the vital powers. White mentions three cases he had known where horses had got to the eorn ehest during the night, and were dead be-

fore morning. Other causes, however, are to be added, one of which is over-drinking. If the horse drinks largely at the time when he feeds, it washes the food from the stomach ere it has undergone the salutary changes above alluded to, and thus is prone to fermentation. Sudden change of food is another cause, as from soft to dry; and some articles of food are more liable to produce it than others, turnips, carrots, potatoes, and grass, more than hay or oats, and peas more than barley. Another cause is putting the animal to hard work on a full stomach. When from such causes as these the stomach is oppressed, indigestion arises, and under one of two forms; the food either undergoing no change, forming a dangerous load, or running rapidly to injurious fermentation. The former is less alarming, and treatment will do much: purgative drenches and injections are to be adminstered. It is in this state of matters that *acute foot-founder* is apt to arise, as noted above, where its appropriate treatment is mentioned. In the latter alternative, where fermentation occurs, one of the most fatal and fearful diseases of our domestic animals is produced. The horse may bo seized on the road, and if pushed to a fast pace, death often ensues. He slackens his pace, wishes to stop, and attempts to lie down. Sometimes he falls down as if shot, the moment he is stopped; at slow work he sometimes quickens his pace, and is unwilling to stand. In the stable he paws the ground with his fore-feet, lies down, rolls, sometimes quite over, or lies on his back. When tho distension is not great, he may lie tolerably quiet for several

minutes, but when considerable, he neither stands nor lies a minute, and is no sooner down than he rises again; he generally starts all at once, and again throws himself down with great violence. He strikes the belly with his hind-feet, and often looks anxiously to his flanks, sits up as a dog, and sometimes attempts to vomit. As the disease proceeds, the pain becomes more and more intense, the horse darting himself about with terrible violence; every fall threatens to be his last; perspiration runs off in streams, and his agony appears extreme. The belly is always swollen, and the girth may be torn. On dissection, the stomach is frequently found to be burst, the belly full of its contents, and of gas, and the diaphragm ruptured. When death is delayed, the bowels are found inflamed, often twisted, and sometimes burst, or obstructed by a dust-ball. The treatment consists in arresting the fermentation, and re-establishing the process of healthy digestion, which is to be effected by the most powerful stimulants and carminatives, or by purgatives and anti-spasmodies.* These must be ad-

* Linseed oil raw, one pound; oil of turpentine, from two to three ounces; laudanum, from one ounce to two ounces;—the whole adminstered as a dose. Or hartshorn, from half an ounce to an ounce; or chlorate of lime, half an ounce given in two pints of tepid water. The following tincture may sometimes be kept in readiness:—Take good spirits, whisky or brandy, two pounds; cayenne pepper, one ounce; ginger, three ounces; cloves, three ounces; digest for eight days, and add sweet spirits of nitre, four ounces. Half a pint of this tincture is a dose, in a quart of warm water. In cases of pressing urgency, from one ounce to two ounces of tar may be added to half a pint of spirits, and given diluted, with great prospect of advantage, especially to cattle.

ministered as a dreneh ; the abdomen should be rubbed, and the animal should be supplied with a good bed, and room to roll about. If there be no relief in half an hour, a second dose may be given, and ere long, if still required, a third. The probang too may sometimes be introdueed, and the relief it affords is sometimes eonsiderable. In the majority of eases this treatment will sueeeed, if the bowels have not been previously inflamed or burst. This form of the disease is nearly eonfined to heavy draught horses, whieh are long in the yoke, have keen appetites, and devour greedily, and with them it is very eommon. The eomplaint has reeeived various names in different plaees, sueh as *Gripes*, *Colic*, *Flatulent Colic*, *Spasmodic Colic*, *Frett*, *Batts*, *Enteritis*, or *Inflamed Bowels*, and *Acute Indigestion*, ete. This superabundant, not to say eonfused nomenelature, is annoying not only to the ignorant, but even to the well-informed, and should be reetified. The disease eorresponds to *Tympanitis* in man, and the old name Hoven is perhaps the best.

Hoven. Blown. Fog-Sickness. The name Hoven universally expresses the oeeurrenee of the above disease in eattle and sheep, the strueture of whose digestive organs renders them peeuliarly liable to the eomplaint ; while the sudden ehanges to whieh they are exposed in feeding prove exeiting causes. Thus it is often witnessed in animals removed from eonfinement and winter-feeding, to the luxuriance of the elover field ; and in house-fed eattle, from the exhibition of rieh food, such as pease meal and beans, often supplied to enrieh

their milk. I have already mentioned that it sometimes proeeeds from obstructed gullet. The symptoms bear so close a resemblance, both in their progress, and termination in rupture and death, to those so fully described above, that I shall not repeat them. The same treatment is generally required, and it must be equally prompt. The mixture of the oils of linseed and turpentine is nearly a specific. In addition, the probang is often used with advantage ; but so violent and rapid are the symptoms, that recourse must sometimes be instantly had to the operation of PAUNCHING, which, though apparently a desperate remedy, is generally attended with success. The place for puncturing the pauneh is on the left side, in the central point between the lateral processes of the lumbar vertebræ, the spine of the ilium, and the last rib. Here the trochar may be introdueed without fear. If air escape rapidly, all is well. The canula may remain in for a day or two, and on withdrawal, little or no inconvenienee will usually manifest itself. If no gas escapes, the opening must be freely enlarged, till the hand can be introdueed into the pauneh, and its contents removed, as I have sometimes seen in prodigious quantities. This done, we should close the wound in the divided paunch with two or three stitches of fine catgut, and earefully approximate and retain the sides of the external wound by metallic sutures, and with rest, wait for a eure, whieh is often as complete as it is speedy.

The BRAXY, so fatal in sheep, comes to be considered here. It has been divided into several varieties, as

bowel sickness, dry braxy, etc. The disease particularly attaeks sheep when in good eondition ; and when they are suddenly deprived of their wholesome food, and foreed to feed upon eoarse grass and heather, etc. Constipation appears the exeiting cause ; violent inflammation sueeeeds, with mueh agony to the sufferer ; great tendeney to swelling, so that the viseera and the abdominal cavity sometimes burst ; and withal, a tendeney to mortification and sinking, so that after speedy death, the toueh of the viseera, and even the earease, is intolerable. The disease is often stated to be hopeless ; but if met early, and treated on the principles already laid down, so gloomy a prognosis should not be formed.

Assoeiated somewhat with the last disease as to eause, yet differing materially as to symptoms, is the Stomach Staggers, whose immediate eause is usually stated to be in the stomaeh, while some of its most eonspieuous symptoms affeet the brain, whieh I am persuaded is deeidedly implieated ; henee its compound name. Mr. White eonsiders that the eomplaint is caused by enormous distensions of the stomaeh ; in a marked ease, sixty pounds of hard and imperfeetly-mastieated food having been found in the viscus, the eoats being stretehed and attenuated ; and an approximation to this state being seen in many others. The horses most liable to the disorder are sueh as have been exhausted by hard work, unwholesome food, and old age. The disease often makes its appearanee first after a long fast, and over-work, but frequently also when the

horse is at grass, when the rye grass is ripe and woody, especially if any ergot is upon it. Hence it has been supposed that the quality of the food acts as a cause, especially rank grasses, and noxious weeds, such as the common rag-weed. It has often been regarded as infectious, but probably it is only endemic. It appears most commonly among agricultural and cart horses, which sometimes have fallen victims in scores. In a few cases, it seems to proceed to regular *Hoven.* The most prominent symptoms are the horse's hanging his head, or resting it in the manger; appearing drowsy, and refusing food; the mouth and eyes being tinged of a yellowish colour; there is twitching of the muscles of the chest, and the fore-legs appear suddenly to give way, though the animal seldom falls; the pulse at first is not affected, but in four or five days inflammation of the bowels or lungs supervenes; the bowels are costive, and the dung hard and slimy. The best treatment is to endeavour first to empty the stomach of its load, and then to excite the process of digestion. For the former of these intentions, the stomach-pump should be employed, though it is not so applicable in animals as in man; or tepid water should be administered in large quantities, which, passing speedily from the stomach, is supposed to remove much of the load. Searching and stimulating laxatives are also indicated; most of all croton; also such as aloes and calomel, with ginger or carbonate of ammonia. To these means should be added enemata, and, by and by, some slight cordial. If the head symptoms are prominent, the temporal artery

or jugular vein may be opened, and blood drawn with advantage. Finally, there must be steady exercise, and frequent and careful feeding, under which treatment many cures are effected.* The FARDLEBOUND of cattle and sheep is, I believe, nothing more than a modification of this disease. In this variety it has been ascertained that the *maniplies* are most involved, its secretions are suspended, and its contents become dry, hard, and caked, one solid mass. Though the constipation is great, yet there is sometimes the appearance of a slight purging, which may deceive the practitioner.

INFLAMMATION OF THE STOMACH is not a common complaint in any domestic animal, and is induced chiefly from over-doses of purgatives, and mineral poisons, especially arsenic and corrosive sublimate. In these cases the pulse is rapid, sharp, and small, the extremities cold, the respiration quick; there is also the appearance of dulness and dejection, with great debility. After the bowels are freely evacuated, oily and mucila-

* About the year 1857 great alarm was created by a report that a disease called the Rinderpest, of a highly infectious nature, had made its appearance in the steppes of Russia, and was proceeding from thence in our direction; and such was the alarm created that the leading agricultural societies combined to send out a deputation to inquire into its nature, but before they went I had learned that the disease was one depending on the giving of a scanty and improper food, and quite analagous to common Fardlebound of this country, which is not infectious, and is often treated with success by stimulating and saline purgatives. The disease has long ago subsided and we hear no more of it. A fuller enquiry into the subject will be found in the Transactions of the Highland and Agricultural Society of Scotland, for March 1858.

ginous liquids should be preseribed, with a little opium ; and the food should be very soft and spare. Arsenie was formerly given very freely to horses ; and eorrosive sublimate is still admimistered for a variety of eomplaints. In the ease of an over-dose of the latter poison, white of eggs is an effeetual antidote, if given in time. Without this albumen, inflammation is soon indueed. The best antidote for arsenie whieh has yet been diseovered is the hydrated sesqui-oxide of iron. In the horse it eannot be vomited, whieh aggravates all the symptoms. The pain of the abdomen is made very manifest by the wistful looks of the sufferer direeted to his flanks ; and by the profuse perspiration, thready pulse, great weakness, violent straining and purging, terminating in eonvulsions and death. The stomaehpump should be used as speedily as possible : after this we must boldly use the antiphlogistie regimen, latterly somewhat supporting the strength by bland food and anodynes.

The Peritoneum, as is well known, is a membrane which lines the walls of the abdomen, and invests all its viseera, forming the external eovering of the stomaeh, intestines, liver, ete. Henee it bears a prineipal share in the acute inflammation of all these organs, whieh inflammation is very ready to spread from one to another, till all the infleetions of the eontinuous membrane are involved. Acute Peritonitis, then, is a very dangerous affeetion, attended with marked symptoms of severe general pain in the abdomen, with high fever, quiek pulse, eostiveness, seanty urine, ete. Of all

domestic animals, the disease occurs most frequently in the dog. It is produced by sudden chills and damp frequently after an over-heat, by wounds, sometimes after castration, by the introduction of air into the abdominal cavity, or by irritating substances, as happens in the escape of the contents of any of the viscera, in which case it is almost necessarily fatal. The treatment required is the antiphlogistic, in its greatest rigour, and especially at the commencement, with large bleeding, strong purging, as with croton oil, the free action of the mucous very much relieving the peritoneal membrane; also large enemata, and strong counter-irritation, rubbing the abdomen with some powerful epispastic.

Besides appearing as an acute disease, peritonitis often shews itself in a chronic form, and in both of these aspects it is a common cause of ASCITES, DROPSY, or an effusion of serous fluid into the abdominal cavity. When this follows a violent inflammation, it is usually accompanied with an effusion of coagulable lymph, which more or less agglutinates the parts together, and it is highly dangerous under this form. When the inflammation is moderate, the dropsical affection is not so dangerous. Its symptoms are marked; there is tension of the abdomen, with a feeling of undulation when struck, great thirst, short breathing, and scanty urine. Together with the internal effusion, there is sometimes present anasarca of the abdominal parietes, sheath, and other parts. Here laxatives and diuretics* are the

* For the horse, iodine, in doses of one or two drachms twice a day, has an excellent effect. Nitre, dose from half an ounce to

most appropriate remedies. In many other cases, dropsy is purely a symptomatic affection, arising not from any disease of the peritoneum itself, but from watery effusion, the consequence of impeded circulation towards the heart. Enlargements of the liver and spleen, anomalous tumours in the abdomen, and various diseases of the heart and lungs, operate in this way. The complaint is not very common in the horse, but we have frequently witnessed it in mules and donkeys. Nor is it uncommon in cows and sheep, being often in them conjoined with a similar affection in the chest. It is, however, most common in the dog and cat. The dog, when labouring under the complaint, loses his appetite, the countenance is haggard, the appearance dejected, abdomen distended, and perhaps he is finally suffocated. In these cases, temporary relief may be afforded by TAPPING with the trochar; when, from cattle, five or six gallons may be drawn off, and sometimes with permanent relief. In conducting the operation, care must be taken that the abdomen be swathed, and kept compressed. When dwelling

an ounce; foxglove or digitalis, dose one to two drachms of the powder; cream of tartar, dose one or two ounces; sweet spirit of nitre, *Spiritus Etheri Nitrosi*, dose one or two ounces; oil of juniper, dose one to two drachms—are useful cooling diuretics, given once or twice a day. Oil of turpentine, and the powdered resin, are somewhat stimulant, and therefore not employed where there is fever; they are however more commonly and extensively used than any of the others, and are more certain in their effects, two or three ounces of the oil, and from half an ounce to an ounce of the powdered resin, formed, with half a drachm of ginger and linseed meal, into a ball, by means of palm or other oil, or of soap.

upon the peritoneum, we must not omit to mention that both it and its folds, as in the OMENTUM and MESENTERY, are peculiarly liable to a variety of anomalous tumours, and to tubercles of various kinds, often produced by inflammation, and the occasion of obscure disease and of death. Of these diseases, MELANOSIS is one of the most extraordinary. It consists of an extraneous deposition of a black amorphous mass, or masses, which most frequently appear about the rectum, but may occur in other localities; it is witnessed almost exclusively in grey horses, and particularly when they are passing from a dark to a light colour. All these cases are generally obscure during life, and are more frequently suspected than diagnosed. They are often, however, seen on dissection, and a knowledge of their occurrence is essential to satisfactory practice.

SCIRRHUS OF THE STOMACH is one of those diseases which I have occasionally witnessed in the horse, though I do not remember it has anywhere been described. It occurs at the cardiac orifice and lower part of the *œsophagus*, but is still more frequent at the pyloric extremity. Here the thickening is sometimes immense, appearing like canker of the foot, with numerous and large granulations, several inches long, and making the stomach feel as if distended with food. These morbid growths produce eructation, and symptoms of acidity and distention, as already described. Anodynes may be administered; but the disease is beyond the reach of art.

Diarrhœa, *Flux, Scouring*, occurs in most of the domestic animals. It may supervene as a consequence of *super-purgation*, by which the animal is much weakened, and, in the case of the horse, to his serious detriment. Physicking used to be practised far too freely and frequently; and the regulating of this practice is one of the most decided improvements in modern practice. Diarrhœa, however, often occurs spontaneously, the result of change of food, irritation in the bowels, or chill after over-exertion. When moderate, the pain is inconsiderable; but when aggravated, the mucous membrane, which is the seat of the disease, acquires a tendency to inflammation, and griping and colicy pains are the consequence. It is most frequently witnessed in what are called *washy* animals, whose loins are narrow, with a long space between the ribs and ilium; and this remark holds good of cattle, sheep, and dogs, as well as horses. The disease should always be speedily checked. If the food be at fault, it should be regulated, and green meat should be withheld: if there be ground to suspect any existing irritation, it should be removed by a laxative; and chalk, or chalk with a little powdered opium, may afterwards be administered; this is a powerful remedy, as is also catechu. Starch gruel should be given, and cold guarded against. Some horses, in going to hunt, apparently from the excitement, are troubled with occasional diarrhœa. Starch gruel, with chalk and a small quantity of powdered opium (a drachm for a dose), will generally prevent it. Molten-grease, the *Gras-fondu*, is often associated

with more aggravated cases of diarrhœa. It derives its name from the appearance of fatty matter, forming a crust, or partial covering to the fæcal pellet. It is usually supposed to have a constitutional origin, and to be connected with some inflammatory tendency, more especially of the mucous membrane of the lungs, or with general fever. Be this as it may, it is often produced by violent exertion in a horse which is not prepared for it, being fat and unaccustomed to exercise. The symptoms of threatening fever are present, and venesection is often the first step in the cure; the remaining treatment is the same with that of diarrhœa.—Dysentery, bloody flux (*Cling* in sheep), is likewise an affection of the mucous membrane of the intestines. It differs from the foregoing in having a tendency to be local, especially in the large intestine and termination of the gut; and also in being more violent, more apt to produce febrile action, and effusion of bloody mucus and lymph-like matter, sometimes resembling membranes, and to run on to deep and troublesome ulceration. The blood is sometimes coagulated on the dung, and in such quantity as, with other secretions, to receive the name of The Blood. This is a more dangerous complaint than diarrhœa, and the symptoms, though to a certain extent corresponding, are more severe. Great promptitude, therefore, should be used in endeavouring to effect a cure. In cattle, it is generally easy to arrest it, by administering a dose or two of salts; a single dose often at once checks the disorder. In sheep, chalk and warm

milk, followed up with eatcehu and opium, are very efficacious. In all the affeeted animals, the diet must be carefully regulated, and small doses of calomel, ehalk, and opium given.* This usually aets as a eharm, altering the morbid seeretions, and affording relief. Anodyne elysters may also be used, and eold must be avoided. In obstinate eases, decoction of logwood, or oak bark, eombined with opium, may be administered with great advantage.

Obstruction of the Bowels may arise from a variety of causes, with which the veterinarian should be familiar, and the disease may be more acute or ehronic in its nature. To the former eategory belong violent loeal spasm and inflammation, producing intussuseeption and death in a few hours. In enteritis and peritonitis likewise, there is sometimes a remarkable and very eomplieated twisting, which seems by its mechanieal action alone to obstruct all descent of the ingesta. Herniæ, external and internal, are additional eauses, as are various tumours, which are prone to occur, and seirrhous eontractions of the canal itself, also the presenee of foreign bodies. In all these eases the praetitioner must be on the alert. On the treatment of inflammatory attaeks we have already dwelt. Intussusception is a protrusion of an upper into a lower part of the bowel, or the very reverse may occur, from inverted aetion, as illustrated when the finger of a glove is drawn upwards and inwards. It necessarily induces

* Calomel, from half a drachm to one drachm; chalk, from half an ounce to one ounce; opium, half a drachm to one drachm.

obstruction, and consequent inflammation, and the cause is often witnessed after death: it is very common in dogs, and is more frequent in sheep and cattle than in the horse. The extent to which it may occur is considerable, reaching to many feet of inverted intestine. Sometimes it is near the anus, and a part may protrude, and slough, and yet the animal recover. In a variety of this complaint, occurring in the rectum, the result of constipation, the part impacted with hardened fœces, which it cannot evacuate, is forced onwards by the peristaltic action, and is protruded a hand-breadth, or even to double or triple that extent. In these cases, the gut must instantly be emptied by clysters or by introducing the hand, and then its return is easily accomplished. Cases of HERNIA sometimes occur in all the domesticated animals; in the horse, it is usually produced by violent exertion; it is sometimes congenital. The former cases will usually be fatal; the latter occur in the scrotum of the perfect horse. Hernia consists in the protrusion from its cavity of any organ or part of an organ, through an opening either natural or artificial. The term is, however, usually applied to the slipping out of any portion of the abdominal viscera, generally intestines. The most common kind of hernia met with in the horse is scrotal, which is most common in the entire horse; it is usually caused by violent exertion, and consists of a protrusion of a portion of gut through and into the inguinal canal and scrotal sac. There is another form of hernia well known under the name of umbilical hernia, which generally occurs in young ani-

mals, and arises from the non-closure of the umbilical opening after birth, or even the urachus, in which cases the urine is discharged from the opening. A bandage round the body, or a ligature, will effect a cure. It is, however, sometimes more difficult to treat, especially in calves, owing to their attempts at sucking one another; when they do so they should be kept separate. Scrotal hernia is generally easily reduced if detected early, and before strangulation occurs. There are two other forms of abdominal hernia; one named phrenic or diaphragmatic, when a portion of gut protrudes through a slit in the diaphragm, and is almost always fatal; but I have a preparation in my museum, where the rupture did not prove fatal, although the gut protruded through a slit in the diaphragm. The other, called ventral hernia, is generally caused either by the animal having been gored by an ox, or from being staked, and is usually not fatal. Hernia, when it occurs in geldings or mares, is usually inguinal, mesenterie, or femoral. In young horses affected with hernia, when castration is performed, it must be done by what is called the covered operation. The skin and cellular membrane, and the fibres of the muscle, must only be cut through, leaving the tunica vaginalis entire, and the clams then firmly applied, allowing the testicle to drop off, or to be removed in two days. In pigs the disease is very common, but in castrating them, all that is required is to keep the intestines in their place, and to stitch up the wound in the scrotum firmly. If immediately detected and reduced, the

animal may be saved. FOREIGN BODIES, which usually produce obstruction, are called balls, and are distinguished as hair, dust, and calcareous balls. The HAIR-BALL, very common in cattle and sheep, is produced by animals licking their coats. The hair thus introduced into the stomach, and there supplied with some nucleus, by the constant and almost violent rotatory action of the part, is speedily converted into a ball, most regularly and thoroughly felted. It may continue a long while in the stomach, and be only detected after death. The DUST-BALL, most common in horses, derives its name from being composed chiefly of corn and barley dust, saved in grinding meal, and used as food. It owes its origin to the same phenomena occurring in the stomach, but more frequently finds its way into the intestinal canal. There are often several of them, as of the former. They are almost exclusively found in those animals which have been fed on the substance of which the balls are composed. Whether the CALCAREOUS BALL has a different origin I do not know, but it is of most common occurrence, and is generally found in the large intestine. Its comparative frequency in some localities is ascribed to the calcareous character of the district, or of the water drunk. It often acquires a great size, without giving rise to pain or inconvenience. At other times, however, stealing on gradually, it undermines the health, and destroys life. In an advanced stage, no doubt can remain as to the nature of the disorder. The countenance is haggard, the eye distressed, the back up, the belly distended, the

respiration beeomes hurried, bowels habitually eostive; the horse, when he is attaeked with pain from this cause, will sit like a dog, upon his haunches. Relief may frequently be afforded. Strong purgatives and large injeetions must be given, and under their continued action the offending body is sometimes removed.

Various WORMS, some truly, others erroneously reputed such, infest the alimentary eanal in the domestie animals, and frequently occasion a great deal of unneeessary alarm. Of the former kind are the round worm, *teres lumbrici, teres lumbricoides;* the thread worm, *ascaris*, ascarides vermicularis,* oxyuris, tricoeephalus dispar, whip worm, found in large intestines; tænia or tape worm, of whieh nearly every class of animals has its variety. In some animals, the cœnurus cerebralis undergoes a metamorphosis in passing from one class of animals to another, as, for example, when it is transmitted from sheep and oxen to dogs and eats it becomes eonverted into tape worm in the intestines of the latter. In the horse, the tænia is very rare; in the dog, exceedingly eommon. When the horse is under-fed, his bowels are full of the teres and asearis; and the appearanee of his staring coat, want of

* Many years ago I diseovered that this worm was developed in small eells within the mueous coat of the eœeum, and when sufficiently developed, made its eseape through a small opening in the centre of the cell. It produees considerable irritation, and a troublesome and often fatal diarrhœa is the consequence. Turpentine and linseed oil are the best remedies, and bring away thousands, when the effect will cease: astringents do no good.

flesh, and voracious appetite, betoken their presence. The teres is somewhat larger than in man, the ascaris darker. They occasion gripes and diarrhœa, but the mischief they produce is not great. The principal habitat of the ascaris is the cœcum, although they are sometimes found in countless multitudes in the colon and rectum. Turpentine is a deadly poison for all these worms; but this medicine, so harmless in man, and in most of the lower animals, is apt in the dog to induce suffocation, particularly when given pure, or in large quantities. It should be mixed in small proportion with other oils, as linseed, or in a pill, or enclosed in a piece of gut, and with these precautions, it will be found at once safe and efficacious. In dogs, the teres is the most common, especially in puppies; the tæniæ the most prejudicial. The ascaris likewise torments them. If left undisturbed, the two former often occasion *fits*, followed by emaciation and death. Iron filings, two drachms to a dose, are highly reputed as an anthelmintic for dogs; but we believe turpentine, or small doses of tartar emetic, to be more efficacious. Of the latter class, or those erroneously reputed to be true worms, are various species of the extraordinary *bot*, the larvæ of the *breeze* or *gad-fly*.

The Œstridæ, comprehending the Gad or breeze flies, are not numerous in Britain, though the genus *Gasterophilus*, containing several British species, has been distinguished from the *Œstrus* by Dr. Leach. It is the larvæ of the former which invade the horse, while those of the latter attack the ox and the sheep.

Two species molest the horse, making the stomach and intestines their habitation; whilst in cattle and the sheep, species of the other genus attack severally the skin and the cavity of the nose. Mr. Blaine informs us that the dog is infested with one of these parasites, which he is disposed to consider a bot; but this parasite, which we have often noticed, is, in fact, a species of worm-like animal belonging to the same natural family as the mites, the acarina, and is called the Linguatula Tænioides. A species of Linguatula has been found in the lungs, and attached to the peritoneum of the hare. The great spotted horse-fly, *G. Equi*, which is by far the most common, also makes the ass its occasional victim. Having selected the individual to which her future progeny is to be entrusted, she hovers about till she is prepared to deposit her egg. She then makes a sudden descent on her victim, and glues it to his coat, repeating the operation till four or five hundred are sometimes fixed on a single horse, the inside of the knee and shoulders being the selected localities; for the horse, in relieving irritation with his tongue, lips, and teeth, is made the unconscious instrument of conveying them into his stomach, where alone they can come to maturity. No sooner is this transfer made, than the larvæ are disclosed, and immediately fix themselves upon the inner coat of the viscus, where they hang in dense clusters, attached by their head, which is provided with sharp hooks, and their only food seems to be the juices of the membrane, without their irritating, in common circumstances, the parts. The bots, thus

taking up their quarters about the end of summer, pass the whole winter and spring without undergoing any change, except that of gradually enlarging. When arrived at maturity, they cease to retain their hold on the stomach (before this, all efforts to force them are vain), commingle with its contents, pass into the intestinal canal, and to the horror of stablemen, are ejected in multitudes from the anus. As soon as they find a convenient retreat, they change into a chrysalis, and in a few weeks more, into a fly, which takes wing, finds its mate, and thus is prepared for repeating the extraordinary process. The *Red-tailed horse-bot*, *G. hæmorrhoidalis*, is scarcely half the size of the former. This fly deposits its eggs on the lips of the horse, to the exceeding annoyance of the poor animal, which is no sooner aware of the presence of his enemy, than he tosses his head, and gallops off to a different part of the field. The larvæ taken into the stomach fix themselves exactly like the G. Equi, and differ in their future history only in this, that after leaving the stomach, and passing into the intestines, they are in no haste to make their final exit, but continue for a considerable time at the extremity of the rectum, there creating great uneasiness. Back-raking, under the circumstance, affords relief. The Ox-Bot, *Œstrus bovis*, is about the size of the *G. Equi*. Though appropriated to the ox, this species sometimes attacks the horse. It is a cuticular insect, the eggs being deposited in the skin of cattle, and the larvæ inhabiting a tumour, or abscess formed round them. These

tumours are usually found in the back or loins, and are often larger than a pigeon's egg. When the fly is depositing its ova, the cattle are in the extremest agitation and dismay, and sometimes become quite furious, running off, bellowing, at their full speed. The larva in its cyst gradually enlarges, while the pus that is secreted by the irritation serves for its nourishment. The tumours which are produced are called *warbles*, *wormals*, or *womils*. The skin and hide are permanently injured by being subjected to this process. The Sheep-Bot, *Œ. ovis*, is thought to deposit its eggs on the nostrils of the sheep, though, from the agitation of the animal at the time, it is not easy to ascertain the fact. The larvæ soon find their way to the frontal, maxillary, and other sinuses of the face; here they adhere for a time, producing considerable inflammation. When mature, the larva wriggles from its warm abode, falls into the soil, there becomes a chrysalis, and continues dormant for about two months. We refer for more ample details to the writings of Mr. Bracy Clark, who has acquired such merited celebrity for his elucidation of this, and other abstruse subjects in the different departments of the science.

A variety of diseases are usually enumerated as occurring in the Liver, more especially in the well-fed dray horses of London, and in stall-fed cattle. Acute Inflammation is one, in which the pain of the affected part is very obscure, and the natural language of the sufferer not very expressive; nor is the symptomatic fever marked. Here a striking analogy is noted, how-

ever, between the lower animals and man, inasmuch as there is generally a sympathetic pain in the right shoulder, so strongly marked as often to be mistaken for the principal disorder, and treated accordingly. Yellowness of the eye, and mucous membranes, and of the urine, are also present. Bleeding, and purging with aloes and calomel, are the appropriate remedies. Besides acute, there is also CHRONIC INFLAMMATION of this viscus, marked by enlargement and softening, and not unfrequently ulceration. The characteristic symptoms are, a languid eye, unwillingness to move, indifference as to feeding, yellowness about the mouth, unthrifty coat, high-coloured brownish-yellow urine, constipated bowels, with fæces not of the natural appearance, but either of a light colour, from want of bile, or of a dark hue, from excess of it. Along with this, there is pain, often with lameness of the right shoulder. Under a course of laxatives with aloes and calomel, we frequently find these symptoms disappear, and health restored. If inveterate, it sometimes happens, as subsequently proved by dissection, that the viscus is quite disorganized, and frequently ruptured, necessarily accompanied with great sinking, and sudden death. JAUNDICE, commonly called the *Yellows*, is another disease which occurs, but is more frequent in the dog and sheep than in any other of the domestic animals. Enough has already been said to elucidate its symptoms and treatment.

The true pathology of the ROT in sheep was long ago pointed out by the late professor of agriculture at Edinburgh, to be "a direful ruin of the general health

and constitution, which supervenes from deficient or depraved aliment." In Scotland, it is agreed that it never occurs where there is an adequate supply of good pasture, and rank grasses are held universally to occasion it. Dr. Coventry moreover stated, that if not rendered desperate by fatal complications, every flock and every sufferer may be recovered by simple means, seasonably used. When all the powers of the constitution are once prostrated, other and hopeless diseases undoubtedly appear, of which character are pulmonary consumption, and the disorganized liver, which have attracted so much attention. This disorganization of the liver is caused by hosts of a species of trematoidis, or sucking worm called faseiola hepatica, distoma hepatica, or what are called *fluke-worms*, from their resemblance to flounders and other flat fish, and whose history is yet involved in obscurity. Whether with the rank grasses of marshy lands, which the sheep under the circumstances are compelled to eat, the ova of the future parasite gets admission into the frame, is a point which remains to be investigated. The cause, however, being recognised, the disease may generally be avoided, and when it exhibits itself, the remedy is alike plain and simple—to remove from the noxious feeding, to relieve the bowels, by the free use of salt, and supply plenty of wholesome nourishment.

The diseases which have been principally signalized in the SPLEEN, are *enlargement*, usually chronic, often united with *tubercles*, sometimes with *softening* and *rupture*, and of course speedily followed by death. These

diseases are not very common, and are certainly obscure, being apt to be confounded with the anomalous tumours already noticed. They may be marked by rigors, loss of flesh and appetite, but the symptoms are rarely conspicuous. After sudden death from rupture of the intestine, occurring in a pony at work the day before, we found this organ to weigh not less than seventy-two pounds. Within these few years an acute disease of the spleen has frequently occurred in the form of splenic apoplexy in cattle and sheep. It proves rapidly very fatal, and appears to depend on similar causes as quarter-ill, such as poor, cold pastures, and bad water. The animal lies mostly on the right side, has a peculiar moan, and is affected with grinding of the teeth, moping with the lips, saliva flowing from the mouth, an anxious or haggard look, eyes injected, ears and legs cold, pulse 60 but soft, tenderness along the spine and left side, respiration slightly quickened, rumen hard and full, urine reddish coloured. The treatment must be chiefly preventive by purging the stock, and inserting setons in the dewlap, but especially by changing the pasturage and water, and attending to the drainage and ventilation. A miasma like that which produces ague in man, will commonly be found in situations where the disease prevails.

Under the patronage of the Royal Agricultural Society of England, an investigation into splenic apoplexy was lately instituted. Professor Simonds drew up a report on the nature and causes of the disease, and came to the conclusion that it was an affection of the

blood. Professor Buekman stated the result of his examination of the botanieal produee of the farm, and the pastures where the disease prevailed, and found the land to be of a poor deseription, prineipally owing to the want of drainage, but diseovered no poisonous grasses. Dr. Voeleker analyzed four different kinds of water, and was not surprised to find that animals supplied with sueh water should beeome subjeet to serious diseases. The water was apparently elear, but it was nevertheless foul. If animals had been in the habit of drinking it for a lengthened period, its injurious effeets upon the eonstitution of the animals do not appear to be very obvious, seeing the disease so rapidly progresses to a fatal termination, within a few hours from its attaek.

As Dr. Buekman found no poisonous grasses upon whieh the eattle fed, it appears that no deleterious effeets on the state of the blood or brain, from their ordinary artieles of food, ean be assigned as the immediate eause of the rapid fatality of the disease.

Professor Simonds found, on making a *post mortem* examination, that the spleen of an animal dying from splenie apoplexy was enormously engorged, that it had undergone eonsiderable enlargement, and that there was some reason to believe that the sudden enlargement of the spleen was the eause of the fatality of the affeetion.

Professor Simonds, in his report, "is inelined to regard the engorgement of the blood merely as the effeet, and not as the eause, and that it was a misnomer altogether to call the disease splenie apoplexy ; that it was in reality an affeetion in which some of the eon-

stituents of the blood undergo certain changes: these changes, in consequence of the disturbed state of the organism thereby produced, rendering the spleen of such an enlarged size. The blood was brought to a standstill in that organ, and hence the large increase in size." Professor Simonds considers the disease entirely a blood affection, presuming it to consist, as may be inferred from his remarks, of a *disintegration* of that fluid; but to what cause this disintegration can be assigned, whether to miasma, acting through cerebral influence, etc. etc., the profession is left as much as ever in the dark.

Before leaving the abdomen, we must mention, that in taking leaps, horses are sometimes wounded in the belly, or STAKED. The wound may, or may not penetrate the cavity, but its depth is easily ascertained by the finger. In the latter alternative, it is comparatively of little consequence, and the treatment is the same as in other skin wounds. In the former, it is much more serious. A portion of the bowel is almost sure to protrude, and the quantity is augmented by every step that the animal takes. Examination should instantly be made to ascertain if the bowel itself is wounded. If so, the lips of the wound must be nicely united with catgut ligatures, before the intestine is returned. If this cannot be done at the moment, a bandage and pad will prevent its farther escape till proper assistance is procured. If the bowels are uninjured, by a little gentle manipulation they may be replaced, the edges of the external wound drawn together, and secured by pins and tow, and a bandage bound round the body, sustain-

ing a compress over the aperture. Our dread, after this, is that enteritis may be produced. Hence the antiphlogistic regimen must be pursued, and in all its vigour. Venesection must be freely, and if there be tenderness, repeatedly used; the diet must be very spare and of the softest kind, and with great care, a cure may be effected. Another variety of the accident remains to be noted: it is where the muscles, or other parts of the parietes of the abdomen, are torn, while the skin remains entire; a sac being formed, into which some of the abdominal contents may protrude. In this case bandages and pressure must be carefully applied, and laxatives and spare diet prescribed.

In commencing my review of the diseases of the URINARY and GENERATIVE ORGANS, I remark that in the horse considerable advantage is derived from the size of the parts, which allows the ready introduction of the anointed hand into the rectum, so that the viscera, including even the kidneys and ureters, may be carefully examined. NEPHRITIS is not a very common disease. It may be acute or chronic; sometimes it is idiopathic, sometimes caused by the exhibition of particular drugs and food. When acute, the pain is violent, there is symptomatic fever, and a peculiar straining of the body; the animal frequently lies down, and points with his nose, in his attempts to reach the seat of the disease; the urine is high-coloured and scanty, and there are frequent ineffectual efforts to pass some. The treatment consists in the vigorous employment of the antiphlogistic regimen, in the free use of decoctions

of linseed, in fomentations and mustard poultiees; blisters and turpentine being earefully avoided. In the eow, pus is often passed with the urine, whieh ought, and may easily be distinguished from *Leucorrhœa.** Hæmaturia, bloody urine, generally arises from a diseased state of the kidneys, though it is sometimes produeed by diseased states and fungus of other parts of the passage, and sometimes by violent strains and internal ruptures. Diabetes Insipidus, whieh is a protraeted and inereased seeretion of urine, with a ehange in its ehemieal composition, is not a very rare eomplaint in horses. Great thirst is usually a prominent symptom, and feverishness. The pathology of the disease is obseure, but seems to be eonneeted with derangement of the digestive organs. Purging, especially with aloes or eroton, or with salts, together with astringent medieines, sueh as earbonate of soda, ehalk, and lime, also eateehu, should be used, and a ehange in the food, whieh should be of the best quality. Carrots are regarded as serviceable, as also the mixture of a little pipe-elay or peasemeal with the water drunk. I have found iodine in doses of two drachms onee or twiee a day a never-failing remedy, very useful in eorreeting the thirst, and eheeking the flow of urine. I have not met with diabetes mellitus, or saeeharine diabetes, whieh is eharaeterized by the presenee of sugar in the urine, but which is common in man, and generally proves fatal. Calculi

* When pus is discharged, it follows the flow of urine, and but partially mixed with it. In Leucorrhœa the matter is uniform and white, not mixed with the urine.

are often found in the kidneys of all the domestic animals, including the pig; but they do not readily pass down into the bladder, on account of the horizontal position of the ureters. They occasionally produce immense enlargement of the ureters, and considerable irregularity in the functions of the part.

Inflammation sometimes occurs in the bladder, more especially about the neck; the symptoms are pain in the viscus, and constant micturition, with others as stated under nephritis, and the treatment generally resembles what has been advised for that complaint. The injection of a little warm oil into the bladder often affords singular relief. Inversion of the bladder sometimes takes place in the mare after foaling, and must be speedily returned by careful manipulation, a little warm oil and laudanum should then be injected. Calculus is occasionally witnessed in this viscus, and the symptoms are well marked in the constant irritation and the dribbling of urine; manual examination, per rectum, speedily confirms suspicion. It is sometimes seen in young stots, and an attempt must be made to their relief. This may be effected by cutting into the urethra, or by dilatation. Lithotomy in the horse is not so perilous or difficult an operation as in man, the space being much more ample. The following is the mode in which it may most easily be accomplished. A sound is to be passed up the urethra, till it is felt in the perinæum; an incision is then made into the canal, and a director introduced from this point into the bladder; with the

probe-pointed bistoury the incision is to be enlarged on the side of the raphe; the right hand is now introduced into the rectum, the two fingers of the left into the bladder; the stone may thus be pushed against these fingers and into the blades of the forceps, and by them guided to the neck of the bladder, and so forced through the opening in the urethra. A stone weighing four and a half ounces has thus been successfully removed, and the wound healed quickly. Sometimes a soft pulpy mass almost fills up the viscus. On the 19th June last (1862), I was consulted on a case at Carron Works; a brown carriage horse had been affected for a considerable time previous with what was supposed to be diabetes. On considering the case, I directed that the bladder should be examined, as I suspected there was a stone in it; and on examination, that was found to be the case. Having gone through and examined him, and having at length obtained the consent of the owner, I ordered him to be prepared by a dose of physic and linseed mashes. I intended to have operated on the 17th July, but on the previous Sunday he was taken ill and died in twelve hours. As I had only met with three cases before, I was disappointed in not getting the operation performed. The stone weighed seven ounces and seven drachms. FUNGOUS GROWTHS and ulcerations are apt to occur in the mucous coat of the cow's bladder, and corresponding diseases in the horse, and in the glans penis. In the former case, they are not easily remedied; in the latter, the diseased part should be excised. CASTRATION is a formidable opera-

tion, especially in the full-grown horse, and is best performed by making an incision through the scrotum, allowing the testicle to protrude, tying the arteries, cutting the cord, and removing the gland. These I know are but hints, but my limits prohibit details. As to NICKING and DOCKING, I believe the time is near at hand when even the Cow-leech will perceive the absurdity of endeavouring to improve upon the fair forms of the most graceful works of nature, and will leave the horse's tail, no less ornamental than useful.

INFLAMMATION OF THE WOMB (Metritis) occurs in all the domestic animals, but most frequently in ewes. It is generally produced by rough usage, either before, during, or after parturition, or from retention of the placenta. It usually takes place within a week or ten days after labour, more frequently in young than old animals. The symptoms are, fever, quick breathing, and straining, with a discharge of a brown, bloody, black fluid, pain on pressure on the loins. The best treatment is to foment the loins with hot water, and to inject warm water into the womb several times a day, keeping the bowels open by the use of laxative food, supporting the strength by tonics either vegetable or mineral. Inversion of the womb often takes place to a greater or less extent, sometimes threatening abortion, it must be returned and bandages like a "briehen" applied so as to support the parts, and the hind feet raised above their natural level while in the byre. When abortion takes place it is necessary to remove the cow to a separate place, otherwise other of the cows may sym-

pathize and also abort. The byre should be cleaned and washed with hot lime and properly ventilated.

In parturition assistance is often necessary, especially in the cow, the ewe, and bitch. The natural position which the fœtus presents when about to escape from the womb, is with the head resting on the fore legs, and in such cases the action of the womb will in most cases be sufficiently powerful to expel it, but it often happens that the fœtus has taken an abnormal position, and assistance must be rendered so as to bring it into the natural one, otherwise the mother will be sacrificed from that cause. First, the fore feet may appear in the vagina, while the head is turned back over the right or left shoulder, in such a case the body must be pushed back into the womb, and efforts made to bring the head into the natural position, if that cannot be effected otherwise, an incision, simply through the skin of the fore leg, must be made round the fetlock joint, and then a probe-pointed bistoury, or a covered one fixed on the finger by a ring, ran up the inside of the forearm to the chest, and the skin separated from the limb by forcing the hand up the leg to the shoulder, as far as can be reached, when by a little forceable traction the limb may be drawn away, the head will then likely be easily brought into the vagina, and the extraction effected, if not, the other leg must be removed in like manner, when the head will be readily got hold of and the extraction effected. Second, if the head is found between the fore legs resting against the brim of the pelvis, and if the head cannot be got up into the

vagina, the fore legs, one or both, must be removed as already described. The head will then be easily got up, and the fœtus removed. Third, when the tail is only presented, the body must be pressed back into the womb, when the hocks which will be found pressed against the pubes, must be drawn up; if the feet can be got hold of, a greater purchase will be obtained to bring them into the vagina and the fœtus extracted in that manner; failing that, the contents of the abdomen must be removed at the rectum, the pelvis divided at the symphysis, when a cord being attached, and force used, the hind legs will get into the place of the viscera and the quarters collapse so as to allow of extraction. Fourth, if all the four feet are presented it is necessary to ascertain which are the hind legs, this is easily done by feeling for the hocks, fix these by ropes, push the fore legs again into the womb, and apply traction to the hind ones. When the fœtus has been removed, examination should be made as to whether there may not be twins. In cases of monstrosities the size should be reduced by removing some of the legs as above stated.

In preternatural presentations, the pelvis being somewhat contracted, and the fœtus at the same time abnormally developed, the difficulties attending the delivery are increased tenfold. But seeming impracticable attempts in removing successfully and safely the fœtal impacted mass ought not to be relinquished. Practical skill, long-continued efforts, physical strength, and scientific knowledge of the parts, never fail eventually

to bring matters to a favourable conclusion; there must be no faltering or despairing on the part of the operator, he has undertaken a duty which he is bound to perform. Whatever instruments—cutting or extracting—he uses, he must preserve the *suaviter in modo et fortiter in re*, and ought never, having put a stout heart to a "stae brae," to abandon his case, and render all his labours nugatory, by *pithing* the mare. By doing so, he virtually acknowledges himself incapable to accomplish what he has taken in hand.

After parturition the placenta must be removed; if it does not come away of itself, it should be taken away, drawing it out slowly, or the hand may be introduced into the womb, and the connection of the placenta, with the cotyledons in cows, separated by passing the forefinger through them and traction used; injections of warm water may be used.

Cows are very liable to puerperal or milk fever, or dropping after calving; this disease commonly arises from the animal being in too high condition, want of gentle exercise, and the bowels being out of order; a laxative diet should be given for sometime before and after calving. The practice of giving boiled or raw barley at this time is always injurious, well boiled gruel is best, and if the animal is weak, a bottle of warm ale with it, occasionally will do good. The disease generally takes place a day or two after calving; the animal declines to feed, becomes feverish and uneasy, her pulse and breathing is quickened, she lies down and is unable to rise, her eye becomes glassy, she tosses her head over

her shoulder, her bowels beeome constipated, and unless relieved, dies in twelve or twenty-four hours. When it is first observed, a dose of physic should be given ; 1 lb. common salt or Epsom salts, 1 lb. treacle, and 10 croton beans, with 2 quarts of warm water and gruel, afterwards give clysters, and foment the belly with hot water repeatedly, or blister. If the physic has not aeted in four hours, give half the above dose, and repeat again if necessary ; when the bowels have been opened, she will generally recover, but will require nursing, with ale and gruel.

Hysteria sometimes takes place in mares (first notieed in print by Mr. Haycock of Manehester), and is probably due either to irritation of some of the nerve centres, or of the nerves of the uterus.

About four years ago, three cases of that kind oecurred in my practice within a short period, all in mares, two of which it was found neeessary to destroy, the third still survives, but continues affected with returns of the paroxysms on exereise.

Chronic inflammation of the womb is apt to produce leueorrhœa or Whites, the symptoms of which are a diseharge of a white, sometimes eurdy looking fluid. Treatment consists of tonics ; small doses of cantharides will often be found very useful in protracted eases ; weak injeetions of acetate of lead, or sulphate of zinc, will also prove useful auxilliaries.

Inflammation of the Udder (Garget) oecurs in the mare as well as in cattle, as a eonsequenee of parturition ; although it is only in the latter that it is pro-

dueed from the barbarous praetiee of *hefting*, delaying milking that the quantity may appear the greater. In bad eases, when the milk eannot be extraeted in the eommon way, a fine hollow tube (made for the purpose) may be introdueed into the teat; an ingenious instrument of this kind, having a tube for eaeh teat, is exhibited at the International Exhibition, to milk from all the teats at onee; through this the milk flows, and the udder resumes its healthy tone. In severe eases the inflammation runs so high that mortifieation is the eonsequence, and the udder drops off. When this threatens, blood should be drawn freely from the milk veins, purgatives should be administered, the weight of the part supported, and poultiees applied. Suppuration will thus frequently be indueed, an abseess formed, and a puneture being made, will afford relieve. Inflammation of the udder, more general or partial, and sometimes confined to the teat, is frequently so severe in the ewe that she refuses all sustenanee to her lambs, so that they aetually die of starvation. The treatment for the dam, is in prineiple the same as that just mentioned. In the biteh the disease often beeomes ehronie, and exeision is neeessary. Cattle are liable, though rarely, to attaeks of cow-pox, with whieh I saw four cows affected on the 7th September 1862; vesieles are formed on the teats, whieh run through a eertain eourse and then heal up. From these the matter has been taken, and used for vaeeination in the human being, by whieh small-pox has been almost entirely prevented. This has led to the praetice of vaeination in dogs to prevent distemper,

but I have never been satisfied that it does any good. Inoculation with matter from diseased lungs has also been recommended as a means of preventing pleuro-pneumonia, but from what I have learned, the cure is about as bad as the disease. Within a short time, variola ovina or sheep-pox has made its appearance in Hampshire, and apparently spontaneously, although, some years ago, it was said to have been imported, and to have spread by contagion. It is said that inoculation with the matter is the best means of prevention, but as the disease has never appeared in Scotland, I have no experience on the subject. Perhaps vaccination might be found beneficial.

The Respiratory System includes the cavity of the nose, the pharynx, larynx, trachea, lungs, and chest, with their several component structures. Each distinct part is liable to assume morbid action, whilst, at the same time, several of the tissues are continuous, and common to two or more of the above-named parts, so that any disease attacking one, is apt to spread to others.

As regards the Nose, the phenomena produced by its cavities being infected with the *Bot* have already been mentioned. Fungous excrescences not unfrequently proceed from the turbinated bones and septum, and appear as *polypi*, so interrupting the respiration. In their more aggravated form they secrete pus, and produce a considerable discharge, so that the animal may be supposed to labour under *glanders*. The remedy here is to remove the polypus with the forceps, subsequently washing the parts with

a styptic lotion. NASAL GLEET, from inflammation of the Schneiderian membrane, has sometimes been described as an independent local complaint. Any observations which I have to make upon it will find a place, while considering those disorders of which it frequently constitutes a prominent part.

When treating of the gullet, I had occasion to mention one cause of CHOKING, connected with foreign bodies lodging in the narrowest part of the tube. I have now to add, that draught horses, during a dead pull up hill, sometimes choke from the pressure of the collar on the windpipe. They may stagger a little before falling, or fall without warning. The wheels should, under the circumstances, be set across the road, and the collar thrown off the windpipe. The acciden is most apt to occur when the animal is put to draw with food in his mouth, as often happens on canal banks. When the morsel goes down the gullet, it is intercepted by the collar, and the two pressing on the windpipe, compress it ; and so many horses have been lost. A knowledge of the fact should lead to the necessary precaution. INFLAMMATION OF THE LARYNX frequently takes place, the disease at the same time spreading from the delicate lining membrane to the nearest parts. In this way lymph is effused, and the play of the parts impeded. Sometimes the smaller cartilages themselves are altered, being thickened and contorted, and small tumours are apt to be produced, both within the tube and without it. The marked ymptoms are, local pain, difficulty in breathing and

swallowing, and general fever: the treatment required is venesection, and the other parts of the antiphlogistic regimen. Tumours occurring in this locality in cattle constitute the disease called CLYERS, which, though it may not for a time interfere with fattening, yet speedily injures health.

Connected with the larynx and trachea chiefly, but sometimes also with the lungs, are various distressing affections of the breathing, which, from the character of the respiration, have procured for the animals labouring under them such names as these, *Piper*, *Trumpeter*, *Whistler*, *Wheezer*, *Blower*, *Grunter*, *Roarer*, to the causes of which infirmities we shall now allude. The rima glottidis and larynx are supposed to be peculiarly affected when there is that sharp and hasty sound which is expressed by the first two of these terms. The *Whistler* utters a somewhat shrill sound when in somewhat continued exercise, and this is supposed to be referable to some cause producing contraction in the trachea. The sound of the *Wheezer* is somewhat like that of an asthmatic person, and is supposed to proceed from an over-copious secretion in the bronchiæ; it is heard even when the horse is at rest. *Roaring* is confined to the increased sonorousness of breathing, on any considerable exertion. A *Highblower* is an animal which puffs and blows loudly, dilating his nostrils, while the flanks are comparatively quiet; and in the *Grunter* it is supposed there is some altered structure in the lungs, which interferes with all considerable exertion. A horse labouring under this infirmity, when

suddenly touched with the whip or spur, will at all times utter this grunting sound. In further illustration of these material infirmities, we shall dilate a little on ROARING and BROKEN-WIND. Mr. White mentions, that he had once and again examined animals which were perfectly useless from ROARING, and had found every part healthy except the larynx, which was ulcerous. Many roarers, however, have subsequently been examined, in which the larynx was quite sound, while the lining membrane of the trachea was thickened. Tight reining has been ascertained to be a cause, the windpipe being found flattened and bent from the bearing of the bridle. Obstruction of the nose, hepatization of the lungs, and even enlargement of the liver have been suspected. In several instances, we have noticed tumours in the passage, and a wasting of the muscles on one side of the larynx. THICK-WIND is distinguished from BROKEN-WIND. In the former the breathing is rapid and laborious, but the inspiration and expiration are equally so. In broken-wind again, the inspiration is performed at one effort, and the expiration requires a kind of double effort. The cause of broken-wind seems to be the rupture of some of the air-cells of the lungs, whereby air-vesicles are produced on the surface, and the expulsion of the air is rendered less direct and easy. It is usually produced by animals being urged to over-exertion when in bad condition, though a horse may become broken-winded in a straw yard. Although the cure of this affection is not to be expected, yet it can often be very much

mitigated, and that mainly by attending to the diet, condensing nutriment into the smallest compass, keeping the bowels open, and giving little water before work. In some cases, small repeated doses of calomel, opium, digitalis, and camphor, will be found to give great relief.

Tracheotomy is the operation by which the trachea is opened, the name *Bronchotomy* being often inaccurately applied to it. It is performed chiefly in cases of sudden obstruction, which cannot be removed on the instant, but which it is anticipated will soon be overcome. It is frequently practised on the horse. The operation is simple, the incision being made in the mesial line, separating the muscles, and then slitting through a couple of rings, the canula being left in. While the opening was left, we have known the roaring horse to be free from his complaint for many months; but from this operation no one would expect anything like permanent relief.

The account usually given of Strangles is not so simple as it might be. It is a disease of the horse, and few escape it. It attacks them when young, colts not excepted. Generally, however, it exhibits itself at the age of four or five years, during the prevalence of pulmonary complaints. It may be defined a catarrhal affection, accompanied by a specific phlegmonous affection of the cellular membrane of the throat, tending to abscess, with slight fever. The whole cellular membrane, between the branches of the lower jaw, becomes distended with serous and lymphy effusion, acquiring a

firm and solid feel, and is tender and hot; it advances to suppuration, and terminates in abscess, generally of the throat, but sometimes also in other parts of the body. This alone is strangles, all other symptoms being only concomitant or accidental. Such are the soreness of the throat, the redness and discharge from the nose, the cough, and tumefaction of the salivary glands. Inflammation of the trachea and lungs, and some say glanders, may supervene upon this complaint. The only treatment required in an ordinary case, is the application of a blister, to urge nature to terminate the process. The abscess should be opened as soon as ripe, and suppuration promoted by slight digestives. Hundreds of cases have been witnessed without one fatal termination.

Cases of this kind, but complicated with inflammation and suppuration in the larynx which threatened instant suffocation, have come under my notice. By constant hot fomentations to the throat, the abscess gives way during a fit of coughing, and tracheotomy, which many would have resorted to, is avoided. The lapping, by the animal, of sugar, greatly facilitates deglutition, by lubricating the parts, and promoting the escape of the increased secretion from the mouth and nose.

Common Cold is familiarly known in the lower animals; and three stages are observable. At first, there is a discharge, chiefly watery, from the nose, with irritation of the nasal and neighbouring membranes; secondly, in two or three days there is a copious dis-

eharge of thiek yellow mucus, and the membranes beeome slightly inflamed ; there is irritation of the larynx and traehea, with fulness and a tendency to swelling, feverishness, and sonorous eough. Soreness of the throat is often present, and the lungs frequently become involved. In the third stage, usually most marked where the treatment has been negleeted, the animal apparently regains health and spirits, but the eough, though milder, eontinues ; an evil whieh should anxiously be guarded against. The nasal diseharge also eontinues, and sometimes terminates in *glanders*. The complaint, as it regards the horse, requires nothing more than a few days' confinement in a stable of mean temperature, from 50° to 60° Fahr., warm clothing, branmashes instead of corn, with a little laxative and diuretie medicine. If the parts about the throat are mueh involved, an epispastic should be applied. If the eonstitutional symptoms run high, venesection should be employed, and the sooner the better. In combating the third stage, a rowel or seton may be made under the jaw ; the bowels should be kept free, the animal gently exercised, and tonics, as sulphate of iron, in four drachm doses daily, will greatly expedite recovery.

Epidemic Catarrh, Influenza, the Distemper of *Horses* and *Dogs*. This very prevalent disorder is, we eonceive, not infectious, but epizootic ; and different epizooties exhibit characters as diverse as it is possible to conceive. Consisting essentially of the train of symptoms so well known as catarrh, with the addition

of fever, more like the product of an atmospheric poison than any thing else, the symptoms are sometimes those of high inflammatory diathesis, sometimes those of the most complete depression and exhaustion. Hence, the most accurate description of one epidemic is quite inapplicable to another, and even the individual cases differ, though partaking of the general type. This being true of the symptoms, there is a corresponding variety in the treatment and probable result. I shall now make a few remarks on cases at the opposite limits of the scale, and the reader will readily understand the intervening varieties. Influenza, with inflammatory diathesis, comes on like a severe attack of common catarrh, the lining membrane of the nose being highly irritable, with increased secretion of watery fluid; the irritation rapidly spreads to the frontal sinuses, the eye, and throat, with oppression, and failure of appetite. Soon, a thick discharge takes the place of the watery fluid, the parts about the throat and windpipe become highly irritable, swallowing difficult, and the food is quidded, and even water swallowed with difficulty; the cough is very troublesome; the pulse rapid, and the fever high. These symptoms would run rapidly to a fatal termination, and blood-letting is clearly the best remedy. The blood is very sizy, the venesection may require to be repeated, and the other parts of the antiphlogistic regimen must be employed. But at other times the attending fever is of the very opposite character, amounting almost to putrid fever, when the visitation goes under the name of *malignant* epidemic. De-

bility, and tendency to sinking, here form the type of the attack. From the very commencement, the poor animal staggers in his gait, and can scarcely stand; he refuses food, and is deprived of all energy; the pulse is rapid, small, and weak, while the catarrhal symptoms still continue. Even at the commencement, there is scarcely room for venesection, and yet the tendency to inflammation is manifest, and not only in the respiratory organs, but also in other parts. Here the practice must be the reverse of that above alluded to; refrigerants, anodynes, tonics, saltpetre, sweet spirits of nitre, camphor, laudanum, and wine must be had recourse to, with hand-rubbing, wisping, judicious ventilation, clothing, and placing in a loose box. These are descriptions of extreme cases, and the vast majority met with in practice lie between them. Sometimes an early and moderate bleeding is all that is required. The tendency to sinking appears to be thus diminished; and sometimes no venesection is required. The complaint is apt to be tedious, and also to relapse; so that the considerations which would recommend care after common catarrh, are doubly cogent in reference to influenza. I have stated that this is the distemper of the horse: it is also the DISTEMPER of Dogs, in which it is apt to be severe, accompanied with a staggering gait, and delirium from affection of the brain. In milder cases, it forms the SNIFFERS of various animals.

Under the general term INFLAMMATION OF THE LUNGS several very distinct affections are included. The bronchiæ are lined with mucous membrane to the minutest

cells ; the entire organs—all the lobes—are included in the lining membrane, the *pleura*, which also covers the whole internal cavity of the chest, and the parenchymatous substance of the lungs themselves. Hence bronchitis, pleurisy, and pneumonia, though all in a general way inflammation of the lungs, and having many things common, yet differ widely in symptoms, history, and treatment. They are all in the highest degree dangerous, are marked by symptoms of high inflammatory fever, and require prompt observance of the antiphlogistic regimen. A tendency to Bronchitis, and often more than a tendency, is witnessed in *catarrh*, and still more in influenza, and it also shews itself as an original idiopathic affection. The irritation and soreness are considerable, the natural secretion is apt to be greatly augmented in quantity, and vitiated in quality, becoming viscid and grumous, and suffocation and death may be the consequence of the effusion into the air-cells. Pleurisy, again, is apt to attack the serous membrane, from sudden chills and other causes ; the inflammation speedily proving a great check to the breathing. Serous effusion is usually the consequence, whereby the play of the lung is impeded, and may be arrested, and lymph effused, whereby dangerous adhesions are produced. Pneumonia, again, with somewhat of the same local symptoms, extends to the disorganization of the proper substance of the lungs, loading them with effusion, and hepatizing them. These diseases, though distinct in origin and nature, are apt to be combined in progress, and hence the hazard is augmented. This is particularly

the ease in eattle affeeted with Pleuro-Pneumonia; all the tissues frequently beeome involved, rendering the symptoms more obseure, and inereasing the difficulty of the diagnosis to young praetitioners, but by pereussion on the sides, along with eareful auseultation, a partieular grunt will be heard, indieating the morbid aetion, the disease being further distinetly shewn by the other febrile symptoms. As in many eases the heart is involved, the eomplexity of the diagnosis is inereased.

In pleuro-pneumonia, the different morbid ehanges in the strueture of the parts, whieh I have deseribed, will be found on disseetion, in various modifieations, in different animals, but under one general form, eharaeterized by inflammation, effusion, suppuration, or gangrene, to a greater or less extent. In eonsequenee of a great number of animals, almost always in the same loeality, beeoming affeeted with the same series of symptoms, it has been thought that the disease must have something of a speeifie eharaeter. This disease has prevailed for a great many years, and has spread to an extent that has proved a very serious loss or ruin to many. It has spread terror wherever it has made its appearanee, and has given rise to a very eommon belief that it has arisen from, and is propagated by, infeetion. This is a very easy and simple way of aeeounting for the spread of the disease in all parts of the eountry, and in other parts of the world. This opinion, I humbly think, and have long thought, has been adopted hurriedly, and promulgated rapidly, without that diseriminative eonsideration of all the bearings and relations whieh so important

a question deserves. The etiology and autopsy of the diseased animals, do not warrant this very peremptory and one-sided conclusion, which the advocates of the very infectious nature of pleuro-pneumonia have formed. One of the most dire and evil consequences arising from such a theory I here take occasion to point out, the more especially that it seems to have been wholly overlooked by the alarmists in their horror of contagion, I refer to the unnecessary and often wholesale slaughtering of animals a few of the most unreflecting contagionists recommend, without for one moment taking into account the real causes of the origin and spread of the distemper. Two hundred years ago Sydenham published his opinion regarding the nature and origin of the different epidemics which prevailed in his time, referring their periodical attacks on the human race, to what he called "the *atmospheric constitution of the year.*" In that opinion regarding pleuro-pneumonia I concur. In proof that my opinion has not been rashly formed, I may also adduce the gradual relaxation of the rigid and injurious quarantine laws, effected through the influence of enlightened medical opinion on the progress and prevalence of epidemic diseases. Pleuro-pneumonia appears to me to be one of those epizootics which depend on atmospherical influences, of which we have many examples. The potato blight and vine disease are instances in the vegetable kingdom of this kind; no one, I think, will believe that they are produced by infection, so suddenly do they appear, and so rapidly spread. Let me ask, where did the *first case*

of pleuro-pneumonia *originate*, if it had not *a spontaneous origin?* The cholera was at one time considered highly contagious, but medical opinion has undergone a great change on that important point. Fevers are similarly produced. But while firmly persuaded of the non-contagious nature of pleuro-pneumonia, I am equally persuaded as to the advantages, nay, the necessity, of separating the diseased from healthy animals, and of making a careful selection of animals from stock in which the disease is suspected to exist, not from dread of infection, but because, while the prevalence and continuance of the epizootic depends on atmospheric influences, as the proximate cause, the predisposition to the disease itself, as well as aggravations of the attack, may be superinduced by a concurrence of extraneous circumstances, such as the huddling of animals together in over-crowded sheds, with high feeding on artificial articles of nourishment, without free air and exercise, where the air becomes deteriorated, the exposing them to currents of air or draughts, and to such remote causes as affect their constitutional health, such as arise from want of shelter, imperfect ventilation, drainage, and cleanliness, of which I have given some striking examples in my paper "On the non-contagious Nature of Epizootic Diseases," which was published in the March number of 1858 of the Transactions of the Highland and Agricultural Society, pages 4 and 5.* The notion that Pleuro-Pneumonia

* Contagion does not only not account for the origin of disease, but leaves its partial attacks and its total disappearance an

arises from infection has given rise to the most extravagant proceedings in Australia and America. It was supposed to be so highly infectious that it was resolved to cut the disease short at once, by destroying not only all cattle affected, but also all that had in any way come in contact with them. The consequence was that thousands and tens of thousands of animals in Australia have been slaughtered, and their carcases burned, in the vain hope of getting rid of the disease. It seems never to have occurred to them that the disease might be epizootic, depending on atmospherical causes, for they continued to slaughter wholesale, until their destructive onslaught was almost exhausted, when Mr. J. Wood Bielby, in the Sydney "Economist" of the 31st January 1862, came forward, and boldly denied that the disease is propagated by contagion. Other individuals have come to the conclusion that the disease cannot be stopped by the slaughtering process; and in a paper called "The Country Gentleman," published in Albany, N. Y., 3d July 1862, I observe in a foot-note by the editor, on a paper in that number, that there can be no doubt that occasional cases of the disease occurred for some years previous to the general outbreak.

It has been proposed that cattle should be inoculated with the matter to prevent the disease, but the

inexplicable enigma, for if its propagation depended on such a cause, its permanent continuance would be a necessary consequence, and not, what it is universally admitted to be, an occasional visitation.

result has been as destructive as the disease itself in many cases. If I am correct as to the causes, then, the best means of preventing the disease will be proper shelter, ventilation, and drainage, as already stated. The treatment must vary according to the particular case; where the symptoms are acute and active, the antiphlogistic plan must be adopted, moderate bleeding, laxatives, counter irritation to the sides, setons in the dewlap, repeated doses of nitre, one ounce each; as the active symptoms subside gentle tonics may be given, and these increased from two to four drachms, sulphate of iron, with as much ginger night and morning in ale or porter, with plenty of gruel. In cases where effusion has taken place, bleeding is not admissible, diuretics, stimulants, and tonics should then be given, or sulphuric acid, half ounce doses three times a day, in a quart of water, or iodine may be tried; if there is much weakness carbonate of ammonia half an ounce three times a day, with ale, or spirits and water, etc. Bleeding in large quantities at first, refrigerants, laxatives, sedatives, blistering, and setons, are the appropriate remedies. As bronchitis advances care must be taken not to allow the strength to sink too much. Chronic Cough is a sequel of the foregoing inflammatory diseases, and of others of the lungs and windpipe, as has been mentioned. It is common, and may often appear innocuous, but should always be regarded with suspicion; the animals suffering under it should be watched, and the bowels kept easy. Boiled turnips, carrots, barley, and bran mashes form useful feeding.

Consumption affects cattle, sheep, and swine more frequently than horses, and the young rather than the old. It arises from neglect, cold, and exposure in damp unprotected situations, and is very insidious in its attack and progress. The animal becomes thin, the coat staring, the skin appearing as if glued to the ribs, obstinate cough supervenes, discharge is frequent from the nose, and glandular swellings appear about the neck. On dissection the lungs are found studded with tubercles. Ulcers in the lungs and *vomicæ* are not unfrequent, and the mesenteric glands are sometimes implicated and enlarged. The anterior mesenteric artery, too, is often enlarged, especially in the ass, and within it are found a number of worms, the Strongylus Armatus, and Filaria. It is in the early stage alone of the complaint, that anything can be done, and the prospect of cure is but faint.

Glanders and Farcy are usually regarded as the most important diseases to which the horse is subject, (the mule and ass are also liable), but every account with which we are acquainted is nevertheless unsatisfactory, and more calculated to puzzle and perplex, than to enlighten and satisfy. One author mentions that no fewer than sixty causes of the complaint have been enumerated, whence it may be safely concluded that the true one was yet to be found. The full elucidation of the subject would require more space than I can here allow. Professor Dupuy, in his celebrated work on the subject,* rendered good service when he so ably and

* De l'Affection Tuberculeuse, etc. Paris, 1817.

irrefragably established that in this disease (for all are agreed that the two named above are only modifieations), there oeeurs the development of innumerable tubereles; whether in one partieular tissue, as the mueous, or in several, has not hitherto been determined. To these minute tubereles we should ascribe the origin of the nasal affection, as well as of the farcy-buds, the absorbents in the former as well as in the latter affection being speedily implieated. At first they are very small. Under certain eircumstanees they may lie dormant, or, on the contrary, they may proeeed rapidly to loathsome maturation, when various parts of the frame become crowded and contaminated with them, to the destruetion of life. It is a domestie disease, unknown among the hordes of wild horses; of a serofulous eharacter, unheard of in elimes where struma is unknown; and of starvation and filth, because it seldom or ever originates in a well-ordered stable, but is ever found rife where the horses are overworked, ill-fed, and negleeted, and, worse than all, kept in an Augean pest-house. That such combination of eireumstanees may induce tuberculous complaints, the history of many familiar diseases too clearly demonstrates. The matured matter of these tubereles is deeidedly contagious, and thus may the disorder be inoculated and propagated in a thousand ways, and it may also, as held by high authorities, have still more frequently a spontaneous origin. There is nothing inconceivable in the idea that this, like other tubereulous eomplaints may, in its early stage, and under favouring eircumstances lie, or be kept latent and

innocuous; whilst, if advanced to a certain point, it becomes irresistible, and defies all the powers of art. Hence the distinction into *chronic* and *acute* glanders.

The disease usually attracts attention only when the tubercles are advancing to maturity. *Farcy-buds*, small tumours, are now seen in various situations, as on the legs, or inside of the thigh, under the shoulder, in the head, neck, or in the axilla, produced apparently from over-exertion or exposure. The tumours should be touched with lunar caustic or the cautery, and tonics prescribed (sulphate of copper, zinc, or iron); everything in the stable obnoxious to health should be removed, and the animal get full diet, plenty of air and exercise; it is difficult, however, to arrest the disease, but a cure may be occasionally effected. When the disorder commences, as commonly, in the nasal cavity, the discharge is successively watery, gluey, pustular. When inspected, the surface being studded with small ulcerating tubercles, has a marked and peculiar aspect, not uniform and continuous, but irregular and angry, from the number of minute irritable ulcers, with deep and well-marked margins. Under favouring circumstances these spread fast; all the nasal cavities are soon involved; the lymphatic glands under the jaw participate; tubercles develope themselves in the lungs, usually the prelude of death; the horse loses flesh; he falls from his meat; cough succeeds; strength fails; the discharge from the nose becomes purulent and most offensive; and the emaciated loathsome animal must at length be relieved from his misery. Whenever the disease

appears among a sound stud, the infected animal should instantly be removed, and every part of the stall, stable, and its furniture, must undergo a complete purification ; but the glandered horse, well fed, lodged, and groomed, will often work for years, and improve upon it. Such animals are sources of danger to other horses, also to their attendants, who may be glandered by them ; but isolated, they may be profitable to their owners, and not burdensome to themselves. Simple discharges of matter from the nostrils must not be mistaken for glanders.

Water of the Chest, as stated above, is an occasional consequence of Pleurisy, which, under the circumstances, requires time and great care ere it can be remedied. Often, in more chronic cases, pain and symptoms of inflammation are not detected. Effusion, however, steals on in the cavity, and the lungs become oppressed. The chest when struck now returns a dead, dull sound, and not the sonorous tone it emits when the healthy lung is in its normal condition. Diuretics, laxatives with mercury, tonics, and repeated blistering, are the appropriate remedies. It is for such cases that Paracentesis is performed, by which the watery effusion is evacuated, and the lung left free. This operation, however, is often little better than a forlorn hope. The operation is very easily performed. An opening is made between the eighth and ninth ribs, near the anterior edge of the ninth, and not far from the sternal extremity. The trochar and canula are here to be introduced, and the stream flows apace. Caution

however must be exercised, in arriving at a correct diagnosis; for we have known the animal expire in the hands of the operator, in consequence of the operation being performed on the wrong side, when air rushes in upon the healthy lung, instead of water flowing out and relieving the oppressed one, and thus causing instant destruction.

RUPTURE OF THE HEART, but more especially of the aorta, is a common cause of sudden death, several instances of which have come under my notice. Upon making a violent and powerful exertion, the animal suddenly falls down and dies in a few minutes. In such cases, it is frequently found that the aorta, as it leaves the left ventricle, has given way at the attachment of two of the semilunar valves at their connection with its inner surface. In consequence of this sudden reflux of the blood on the valves, the joint attachment, subjected to the shock, is torn back towards the heart, and through the rent, which extends into the other coats of the artery within the pericardium, the blood escapes into it, and so interrupts the heart's action, when death is the immediate consequence.

Horses, when not in proper condition, on getting a severe run with the hounds, are often brought to a sudden stand-still by violent palpitation of the heart. They get blown; a peculiar throbbing, or rather knocking, is observed in the chest, and they fall down and die in an asphyxiated state; but if stopped in time, by giving a little water, and abstracting a little blood, or administering some mild stimulant, they may recover.

The lungs in such cases being considerably congested, a considerable time may elapse before the balance of the circulation be restored.

In all cases of influenza, the heart is more or less affected, and in cases of death there is more or less effusion of serum into the pericardium; while on its external surface, ecchymosed spots abound. This is also the case with the heart, especially on the external surface of both auricles, and also on the lining membrane of the ventricles. The muscular portion is rather pale and flabby. In these cases, the pulse is irregular and feeble, especially in the extremities. The animal is greatly enfeebled, and the lungs are more or less congested.

I have seen a case, however, in which the heart and pericardium were alone involved. I was lately consulted in the case of a mare which was taken unwell. She had left off feeding; her pulse, too, was small and weak; her respiration scarcely affected; her mouth cool; her bowels regular; and her ears and legs fine, but cold. On moving her about in the stall, a twitching of the hind legs of the animal was observed, as if it was affected with cramp. On applying the hand to the left side, a peculiar pulsation was felt, as if the heart was moving in a fluid. This pulsating sound was readily heard on applying the ear to the left side, and was totally distinct from the sounds produced by water in the chest. The case proved fatal, and on dissection, the pericardium was found to contain four pounds of serum. There was no effusion in

either side of the chest, and all the other viscera were healthy.

Horses, that have been overworked and exhausted, are sometimes affected with hypertrophy of the heart. The ventricles become enlarged, especially the right one. The horse becomes weak and easily fatigued, the pulse is intermittent, and there is a kind of rushing sound heard on applying the ear to the sides. He is apt to have attacks of pleurisy, and he dies rather suddenly. Ossification of the auricles occasionally takes place, of which I have two good specimens, and the mitral and tricuspid valves are sometimes similarly affected. The osseous deposit extended nearly over the whole of one of the auricles referred to ; in the other case it was more circumscribed. In all such cases, the symptoms are somewhat similar to hypertrophy. The irregular pulse is very decided, and the peculiar confused and rushing sound is very loud, and the heart grates, as it were, on the hand when it has been applied to the side. This is increased by exercise, and the horse is unable for work. The valves of the left side of the heart are more often affected than those on the right side. When the valves are diseased, the sounds of the heart heard on auscultation are more or less altered. When the auriculo-ventricular valves are affected, a blowing sound of greater or less intensity is heard in place of the first sound. When the valves become ossified the blowing is converted into a grating sound. When the mitral valves are alone affected, the second sound over the region of the pulmonary artery some-

times becomes louder, owing to the partial regurgitation of the blood into the left auricle, and consequent retardation of the pulmonary circulation. When the auriculo-ventricular valves are shrivelled from chronic inflammation, so that they cannot close their respective orifices during the action of the heart, a double blowing sound may be heard, one during the systole and the other during the diastole, while in addition, if the aortic valves are healthy, the normal second sound may be heard at the base of the heart. The first sound and its modifications are heard more distinctly at the apex of the heart, while the second, which is due to the flapping together of the segments of the aortic valves, is heard louder at the base. In diseases of the aortic valves, a blowing sound, synchronous with the first sound, but loudest at the base, may be heard. When the valves are still further affected, and unable to occlude their orifices, a double blowing or rasping murmur may be heard, which is also loudest at the base. In disease of the aortic valves, the pulse is full and bounding, owing to the deficient elasticity of the aorta and large arteries; while in disease of the mitral valves the pulse is small and feeble, owing to the regurgitation of the blood into the auricles.

In pure hypertrophy of the heart, *i. e.*, when the muscular walls of the cavities become increased in thickness, the sounds are not so distinct as usual, while the impulse of the organ against the walls of the chest is increased. When, on the other hand, the walls are thinner than natural, no matter whether the

heart is increased in bulk or not, the sounds become more distinct than in health, while the impulse is diminished. The reason of this is, that the sounds of the heart, which are mainly caused by the vibrations of the auriculo-ventricular and aortic valves, pass more readily through the walls of the heart when they are attenuated, while the impulse of the heart against the side of the chest is necessarily diminished from its enfeebled action.

In cattle, especially in cows, disease of the heart frequently occurs from foreign bodies, such as small pieces of wire, or large needles, having been swallowed by mastication or in rumination, and which, by the gradual process of interstitial absorption, pass through the coats of the stomach into the heart. In their passage, by irritating the pericardium, these bodies produce often a great thickening of its coats. When they are lodged in the heart, general constitutional disturbance and local irritation of that organ speedily cause death.

I have on one occasion found that the death of a young bull-dog had been occasioned by a number of *Teres*, in passing from the auricle to the ventricle, having interrupted the action of the mitral valves by lodging in the auriculo-ventricular opening; and I was lately consulted in the case of a young lion in the Edinburgh Zoological Gardens, whose death, I found upon dissection, had arisen from a similar cause. Both animals had been affected with epileptic paroxysms, and their bodies were considerably emaciated.

have not received that attention in veterinary science which their importance claims. As throwing light upon some of them, and on pathology generally, I shall here introduce a few remarks on PLETHORA. When the supply of food is greater than the exigencies of the system require, an animal usually becomes fat, but still may be tolerably healthy. When, however, a sudden change is made from poor to rich feeding, not fatness but plethora may be the consequence; more blood is formed than the system can easily dispose of, and it becomes oppressed. This effect is often witnessed in cattle and sheep, which, after indulging for a time in luxuriant pastures, take what is called a SHOT OF BLOOD. All at once they become very ill; some part of the body swells, becomes puffy, as if containing air, and in two or three hours the animal is dead, from the *Quarter-evil*, already described. Upon dissection a large quantity of black and decomposed blood is found in the cellular membrane which during life was distended. The horse seldom suffers in this way; but in him plethora creates a strong disposition to inflammation of the eyes, feet, and lungs, and sometimes to an eruption which is called a *Surfeit*, or the *Nettle-rash*. The hair falls off in patches, and the skin is raw and pimpled. There is also a tendency to *grease*, and to what has been designated a WEED, or *Shot of grease*, in the heavy draught breed. One of the legs, generally a hind one, suddenly swells; the animal becomes lame; there is pain in the inside of the thigh, increased upon pressure; and fever supervenes. The disease bears a

close resemblance to the *Phlegmasia dolens* of our species, and the leg often becomes as thick as the thigh. We consider it a disease of the absorbents, these vessels enlarging to the size of a quill, and having their vasa vasorum highly injected. We have seen it occur chiefly during continued rest after hard work and exposure to weather, in animals which were highly fed. The best treatment is large blood-letting, scarifying the limb, fomenting, and applying hay, straw, or flannel bandages, with purgatives and diuretics. The pressure of a bandage will expedite the reduction of the part to its natural dimensions.

Some of the diseases of the sanguiferous system are acute, others chronic. Inflammation may attack the heart from over-exertion, and is always most dangerous; the symptomatic fever runs high, and is generally remarkable for the bounding velocity of the pulse or palpitation. Venesection must be alike prompt and free, and the other parts of the antiphlogistic regimen in keeping; but a degree of inflammation often takes place in a modified form, and gives rise to the weakness we find in what is called Influenza; in these cases bleeding is not so admissible, because the abstraction of blood calls upon the heart in its diseased state to increase its action to keep up the circulation in its enfeebled state; wine or cordials are then required. When pleurisy exists, the pericardium cannot well escape, and the latter membrane may be the origin of the mischief. In either case the PERICARDITIS is apt to terminate in *dropsy* of the membrane, in one case of

which we found not less than four pounds of serum. *Enlargement* of one or other of the cavities is by no means uncommon, and thickening of the walls of the ventricles and of the pericardum often takes place, and the valves and auricles of which are often *ossified. Aneurism* of the great arteries occurs, but is very rare. These affections are more frequent in cattle than in the horse; and not unfrequently we have witnessed some foreign body, as a needle, work its way into the heart, and destroy life. Disease of the heart is readily detected by an irregularity of the pulse, more especially on exercise, and from breathlessness and inability to endure fatigue, also by the regurgitation of the blood in the jugular veins.

Purpura.—A disease in which patches of swelling take place on various parts of the surface of the body, especially about the nose, belly, and extremities. The nasal septum is covered with purple patches, a bloody mucous is discharged from the nostrils, and in some cases an ichorous discharge oozes from various parts of the skin. This affection is accompanied with great debility, and a degree of fever. There is extravasation in the swellings, the nostrils are nearly closed, and suffocation is threatened in the early stage. Puncturing the swellings is required, along with gentle laxatives, mild stimulants and tonics, as Peruvian bark, sulphate of iron, with wine, ale, or other stimuli. The red patches in the nose have sometimes led to the mistake of supposing this disease to be glanders.

In the north I have occasionally heard of a disease

called the crockets, in cattle; it is a species of rheumatism, and is generally cured by giving two drachm doses of colchicum daily for a short period.

The only other complaints belonging to this section we shall mention, are diseases which arise from *phlebotomy*. The first of these, though it may alarm the inexperienced, is very trifling. It is a globular swelling, *Thrombus*, sometimes as large as an egg, arising immediately around the newly-made incision, from the cutieular incision being too small to allow a free outlet to the blood. The filtration of the blood from the vein into the cellular membrane, which is the cause of the disease, is rarely very copious. Gentle pressure may be used at first, and should be maintained with a well-applied sponge and bandage, kept cool with cold lotion. Occasionally there is *inflammation of the jugular* from bleeding, and more rarely, of the plate and saphena vein. This is usually caused by a blunt or foul fleam or lancet, or by repeated wounds, and allowing hairs or other foreign bodies to interfere with the accurate adjustment of the edges of the wound. The first appearance indicative of the disease, is a separation of the cut edges of the integuments, which become red and somewhat inverted. Suppuration soon follows, and the surrounding skin appears tumified, tight, and hard, and the vein itself above the orifice, feels like a hard cord. After this the swelling of the neck increases, accompanied with extreme tenderness; and now there is constitutional irritation, with tendency to inflammatory fever. If, under these circumstances,

the animal be not relieved, the head and neck become swollen on one side, the sensorium disturbed, and death is sometimes, though seldom, the consequence. The mischief is supposed to arise from the inflammation spreading from the surface to the interior coat of the vein ; and the disease in the neck does not proceed towards the heart, as in man, but in the opposite direction. In the first stage we must try to relieve by evaporating lotions, or by hot fomentations. If these fail, and as soon as the disease begins to spread in the vein, the appropriate remedy is to touch the spot with lunar caustic or the actual cautery, simply to sear the lips of the wound, and apply a blister over it, which may be repeated. Purgatives in full doses must be administered, and the neck, as much as possible, kept steady and upright.

Connected with the circulating system, we should not omit to state, that small parasites, popularly called worms, are sometimes found in the blood-vessels, and other parts. This is true in man, and still more in the lower animals. We allude chiefly to the *strongylus* and *filaria*, which are found chiefly in the aorta and cœliac vessels. Allusion has already been made to them under phthisis ; and it is one of the filaria that is found in the aqueous humour of the eye of horses in the East Indies. They are accused of appearing in some of the viscera, and there causing disease ; as, for example, in the bronchiæ of calves and young cattle, producing what is called the hoose. They are small and thread-like *filaria bronchalis*. In these cases turpentine

should be administered by inhalation and the mouth. I have twice, whilst castrating colts, met with a strongylus in the spermatic vessels. The subject is too extensive to be prosecuted here.

The BRAIN and NERVES, as may be well supposed, present an interesting, if not a very numerous group of diseases. We commence with FITS of various kinds; and this the more willingly, as we are not satisfied that their pathology has very satisfactorily been ascertained. SWOONING FITS appear in horses and dogs. The horse staggers, swings from side to side, lies on the pole, in harness, stops and falls, or falls running. The fit probably arises from accumulation of blood in the head; it is most common in hot weather, going up hill; and some animals are very liable to it. Whenever the horse shews any tendency to giddiness, he should be pulled up, and so may recover in an instant. Before proceeding, see that the windpipe be free, and the bearing rein slack. Should the horse fall, remove the harness, assist him to rise, and if water be at hand, give him a few mouthfuls, and bathe his head and face. This attack, in popular language, is a *Megrim*, an appellation which should give place to that of VERTIGO, or *Giddiness*. There are other and more aggravated forms of the affection, proceeding to what is regarded as EPILEPSY, or the *Falling-sickness*. In these cases the horse rears up and falls suddenly, or he reels about and then falls; the muscles of the eye are affected with spasm, so that this organ is greatly distorted; the breathing is often disturbed, and sometimes there

is violent motion of the legs. The duration of the fit varies from a few minutes to several hours. "He," says Mr. Youatt, "who values his own safety, or the lives of his family, will cease to use an epileptic horse." The late Dr. Gregory had his arm broken from a horse being attacked with this disease. If the horse is plethoric, he should be bled. The bowels should be kept open, and the feeding be moderate. Setons to the neck should also be tried. APOPLEXY is a disease to which the horse is not very subject. Sometimes the stroke is sudden, and the case severe; but more commonly some warning is given. The animal will be seen with his head low, or supported against the manger; he staggers as he stands, and if moved, appears as if he would fall; his sight and hearing are affected. He will continue in this state for several, perhaps twelve hours. He then falls, grinds his teeth, with eyes open, protruded, and fixed, the pupil dilated, and twitchings about the frame; he is unable to swallow, the drink is returned by the nostril or the mouth, and the dung often voided involuntarily; the twitchings increase to convulsions, and death speedily closes the scene. The treatment is the most copious bleeding, with the other parts of the antiphlogistic treatment.

The frightful disease of MAD STAGGERS is seen in the horse, ox, and sheep. It occurs in plethoric subjects after great exertion, exposure to the meridian sun, and high feeding, though the distension of the stomach has not a primary share in its production. The first stage is that of sluggish circulation and oppressed brain.

The animal stands with his head thrust against some hard body, his eye closed, and he yawns, doses, and sleeps till he actually falls down, sometimes backwards, in his stall. This startles him, and he rises hastily, but soon relapses. The pulse is slow, breathing sometimes stertorous, the appetite impaired, and the animal will dose with the morsel in his mouth. These lethargic symptoms may continue several days and may at last end fatally, or they may be succeeded by wild and furious delirium. The pulse now rises, respiration quickens, the countenance becomes animated, the conjunctiva flushed. Fits of delirium appear, the horse dashes himself furiously about, throws himself down, lies in temporary insensibility, suddenly rises, again becomes convulsed, and again relapses into stupor. Approach to such an animal is highly dangerous; for he will rear, wheel round upon his hind legs, and fall back with a violence, which threatens instant destruction. These convulsive agonies may continue for hours, before death closes the scene. On dissection the brain is found turgid with blood, and water occasionally in the ventricles. Cattle and sheep (in these animals it is the *Louping-ill*), when attacked, tremble, fall down, and subsequently roll and toss about: the ox gores at every thing within its reach. The treatment must be most active. The bleeding should be pushed to faintness, and the more rapid the evacuation the better. Large doses of common salt, with a dozen croton beans (bruised), should be given in gruel. The same energy should be employed in the other parts of the antiphlogistic regimen.

Water in the Brain, *Dropsy in the Brain, Sturdy, Straggles, Turn-sick, Gid, Giddiness.* This disease is rare in the horse, not unfrequent in cattle, dogs, and swine, and very common in sheep. The disease is sometimes acute, but more frequently chronic, occasionally congenital, when many ounces of fluid are found in the ventricles. Young sheep and hogs are most liable to sturdy. At first the animal detaches itself from the rest of the flock, and appears dull and stupid; by and by it goes round about, as if giddy, and at length appears blind, in which state it may long continue, and yet recover. The disease depends upon the effusion of serum, either on the surface of the brain, or into the ventricles, or upon the presence of hydatids within the skull. The remedies which have been proposed, are the making of a perforation into some part of the cranium, and amongst others, through the nose and cribriform plate into the cavity; and in those cases where the serum or hydatids are thus reached, no doubt immediate benefit may result. About one case in three has been thus restored. The hydatids may occur in any part, and careful examination on the surface sometimes shews the exact locality, so that the spot may be trepanned. In cases where their effects cannot be detected, it would be folly to proceed farther. Blisters and setons have been proposed, and laxatives should be given; and if these fail, the animal should be killed, as the disease does not injure the mutton. Palsy also occurs in the domestic animals, and is common in the dog. In the horse it is sometimes idio-

pathic, but occurs more frequently in the hind legs, from severe injury of the spine. If the disease is slight, epispastics, with friction, may in time be useful; if aggravated, the case is hopeless. TUMOURS OF THE BRAIN are frequently met with on dissection, and precede and probably produce some of the diseases of the head. Their existence, however, can only be suspected, and art has no control over them.

The disease called the SHIVERS—and a horse affected with it is called a shiverer—is a form of chorea. The horse is seized with tremour of the muscles on any attempt being made to push him back. The tail is erected, the whole muscular system is excited as in tetanus. The disease is produced by these tumours in the lateral ventricles of the brain, and I have never failed to find them upon dissection.

My views respecting the highly interesting disease of RABIES, or CANINE MADNESS, are not a little peculiar; but being the result of considerable observation, and leading, as I conceive, to most important and beneficial ends, I will neither conceal nor compromise my decided convictions. I hold, then, that rabies is essentially an inflammatory affection, attacking peculiarly the mucous membrane of the nose, and extending thence through the cribriform plates of the ethmoid bones, to the anterior part of the brain, so giving rise to derangement of the nervous system, as a necessary consequence: this usual train of symptoms, I consider, proceeds mainly from an occasional epidemic, not unlike some forms of influenza or epizootic; and the bite of a

rabid animal is not, to another so bitten, the exciting cause of the disease, but merely an accidental concomitant in the prevailing disorder; and the disease, hydrophobia, produced in man from the bite of a dog said to be mad, is not, in my opinion, the result of any poison introduced into the system. Those who are acquainted with the effects of sympathy, and imitation, and panic, in the production of nervous disorders, will readily apprehend my meaning; and if this view be correct, the immense importance of disabusing the public mind on the subject is apparent. This is a task which I hope one day to accomplish. But in the meanwhile, considering the vast responsibility of promulgating these views, with the fullest conviction of their truth, I shall not press them; nay, I shall, to any greater extent, withhold them at present, and shall now do all the justice our limits allow, to the lucidation of the prevailing, and what is generally considered, the established pathology and history of the complaint.

I shall briefly sum up my views. Chorea, it is well known, is a nervous complaint which affects children, and it is readily communicated by means of sympathy alone, so that it is unsafe to allow a child labouring under it to come in contact with other children, as the unaffected children will all more or less catch the disease. I do not think rabies to be a disease at all resembling chorea among children in its origin or progress. Whatever difference of opinion may exist as to the spontaneous origin of rabies, or the propagation through a specific virus, from the bite of a dog supposed to be

mad, my decided conviction is, that it is caused by local irritation, acting through nervous influence on the cerebrum, and that the whole constitutional symptoms may be traced to, and are dependent at first upon, morbid derangement of the brain, and subsequent inflammation. This is the symptomatic form of the disease, as contra-distinguished from the idiopathic form, in which the cerebrum is the seat of the disease, as acted on by atmospheric influences.

It is generally alleged, that the complaint arises spontaneously only in the canine and feline species of animals, including the dog, fox, wolf, and the domestic cat, and that from them it is readily communicated to others, as to horses, cows, sheep, and man. It is frequently stated, that these last have not the power of communicating the complaint to others; but Mr. Youatt mentions, "that several farriers have lost their lives from being bitten or scratched in the act of administering medicine to the rabid horse;" and Magendie and Breschet have taken the saliva of a man who was labouring under hydrophobia, and have therewith inoculated healthy dogs, which, they assert, became rabid, and bit other dogs, so spreading the contagion. Though the disease has received its name from the horror of water exhibited by man, yet the symptom seems confined to him; rabid dogs lap freely, and sheep affected with the disease are rather greedy of water. It is a great mistake to suppose that every rabid dog must be wild and furious; on the contrary, his faculties are not particularly disturbed; there is no

want of his usual sense, but great irritability; for a time he knows his master's voice, and obeys him. The early symptoms in *Dogs* are usually some peculiarity of manner, and some strange departure from their usual habits. In many instances the peculiarity consists in a disposition to pick up straws, and other small objects. Others keep licking another dog, or cold iron, or stones; and there is often a strong antipathy to strange dogs. As the disease advances, they bite those dogs with which they are associated, and lastly the persons round them, though this only in a moment of irritation; there is also a peculiar change of the voice. The peculiar howl once heard can hardly be forgotten, and at once characterizes the disease. In the *Horse* the symptoms are such as the following: The animal will go to work apparently well; all at once he will stop, tremble, heave, paw, stagger, and fall. Almost immediately he will rise, draw his load a little farther, again stop, look about him, and again fall. The progress of the disease is rapid. The animal kicks and plunges in the most violent manner, often attempts to seize and bite other horses and the attendants, and will level to the ground everything before him, himself sweating, snorting, and foaming amid the ruins; palsy of the hind legs is apt to supervene, the thirst is excessive, and the act of swallowing apparently difficult. The disease rarely extends beyond the third day. On dissection, there is usually found inflammation at the back part of the mouth and nose, and at the top of the windpipe, the origin of the spinal cord, and frequently

in other places. Dogs are, it is said, more susceptible of the disease than man; and thus of twelve dogs and four men bitten by the same mad dog, every one of the dogs, it is said, died of the disease, while the four men escaped. The interval between the infliction of the wound and the invasion of the symptoms varies considerably; in man the mean average is from three to eight weeks. As to the treatment, we would first of all state frankly, that as to cure after the disease has fairly manifested itself, none is recorded in man. Hence the importance recommended of prevention, and that mainly by the speedy and complete excision of the wounded parts. At the moment the individual is bitten, no time should be lost in endeavouring to get rid of the supposed poison. Free washing is said to do something, and after this a firm compress between the wound and the heart, till a veterinarian, or some competent person, be procured, who is taught to excise freely, and apply caustic. Copious venesection is supposed to be the most soothing remedy; and with a hint from the experience of Magendie I must close. This physiologist, knowing the influence of largely substituting water for blood in the circulating system, tried the experiment in a mad dog which was in a furious state, and which instantly became tranquil, and so continued for five hours. Again, he injected one pint of water at 100° Fahr. into the vein of a man's arm; directly the patient, from being highly rabid, became tranquil, and the pulse fell from 150 to 80 in a minute, the convulsive motions ceased, he drank water without difficulty, and continued to improve

till the fifth day. In another case, death followed as in this; but at the moment of the experiment, there was a great and sudden change for the better. The patient lived eight days after the injection, and died, possibly from another complaint. In attempting this treatment, the veterinarian requires unusual dexterity, as well as caution. It is of importance to bear in mind, if I am right in my opinion that the disease is a mental one, that any plan of treatment which may be adopted, if the individual has confidence in it as a means of prevention, is most likely to prove beneficial, hence the fame of many remedies, such as the Ormskirk remedy.

Tetanus. *Lock-jaw* is another of the most melancholy diseases which can be witnessed. It is common in the horse, and occurs also in the ox, sheep, and dog. It proceeds from two causes, the most common being the irritation of a punctured wound in some tendinous part, especially of the extremities (which may give no trouble at the time), or from *docking* or *nicking*, and also spontaneously, especially in hot climates. The symptoms of the complaint soon discover themselves. The muscles of the jaw, as expressed in the synonym, are early affected, forming *trismus;* and the other voluntary ones are soon implicated, as those of the neck, spine, tail, and extremities. But the muscles of the eye, especially the retractor oculi, show the earliest spasms. The animal does not feed as usual, and appears unwell; he drops his food and gulps water. Saliva drops from his mouth, and the jaws are found to be stiff; even his head cannot be turned, the

eye squints, and the *haw* (*membrana nictitans*), is thrown over the corner, by the eye-ball being drawn into the socket; the back and loins become stiff, the tail erect, and the extremities singularly fixed, "like the legs of a stool;" the pulse at the commencement is not affected, but soon gets quick and irregular; the breathing becomes laborious, the countenance wild, and expressive of great agony; the poor animal may die in one or two days, sometimes nine or ten days may elapse before he is exhausted. The rule of practice is to look for the wound which has preceded the disease, and if there be irritation, to relieve it. For the constitutional symptoms, bleeding is the most powerful remedy when congestion in the chest is threatened, and injecting water into the veins, as noticed under rabies, would be well worth a trial. This will promote the operation of physic, which in the estimation of many is the chief remedy. A drachm of croton seed, and six drachms of aloes, may be administered, and repeated the following day, the bowels being torpid. After the bowels are opened two drachams of the extract of belladona, twice a day, appears to be of considerable service. As the animal is easily excited, and thereby much injured, he should be kept as quiet as possible. Blisters have been extensively used, and opium has been given with the appearance of success. In the few cases where life is spared, great care is necessary during the protracted convalescence. Chloroform is worth a trial.

Neurotomy is the cutting of a nerve which supplies a part labouring under painful disease, for the purpose

of easing or removing that pain. High expectations were originally entertained of the value of the operation; and though many have been disappointed, yet it frequently proves highly useful. The late Mr. Sewell, its respected proposer, has operated upon more than five hundred cases, and in eight out of ten, with marked success. The fore-feet are peculiarly liable to accident and disease, and the operation has been very much confined to them. The structure of the parts greatly favours this success, for the muscles which move the feet are situate high up the leg, and their nerves need not be interfered with, as it is cutting the nerve of sensation which affords the benefit. The practice was originally proposed for horses incurably lame, and for cases that would not admit of relief by any other means, and to these alone it should be restricted. It is applicable to any kind of chronic lameness about the feet or coronet, except pumice feet, and succeeds best where there is no alteration in the form and texture of the hoof; and in anchylosis it often yields great benefit. If inflammation or ulceration be present, the operation must at all events be postponed, since it would aggravate these states. The operation is not difficult. The horse being cast and secured, an incision about two inches long is to be made upon the side of the large pastern bone, or fetlock, in the direction of the large pastern nerve; the trunk of the nerve is to be laid bare, avoiding the artery which lies anteriorly, and about one inch of it is to be cut out; the incision is to be made on both sides, and in both legs, if both are

diseased; the wound should be if possible healed by the first intention.

STRINGHALT is more a blemish than a disease, though it is unpleasaut to the rider. It is a convulsive kind of action in the muscles of the hind-leg, supposed owing to irregularity of nervous influence. Neither its precise seat nor nature is accurately known, and dissection has failed to throw any light upon it. It is most conspicuous when the animal commences exercise, and in a short time it greatly subsides. Any method of cure is yet unknown. As however it is a morbid action, it must be held as an unsoundness.

The DISEASES OF THE EYE are highly important, the slightest blemish interfering with the usefulness and value of the animal; and though not numerous, they have ever been found most untractable, and regarded as reproaches to the science. Criticising the labours of the many authors who have so ably illustrated our art, is what I would scrupulously avoid; but on the present occasion, a sense of duty constrains me to warn the student generally against many of the views and statements which have been promulgated; no where have I seen more incorrect observation, or more erroneous pathology. The organ is most delicate, and the anatomy most minute; and it is upon an accurate acquaintance with its structure, both in health and disease, that sound practice can alone be based. To one ignorant here, all is obscure; his treatment must be undecided, and of course unsatisfactory. The diseases of the organ are, to a remarkable extent, the result of the domesticity

to which we have subjected the lower animals, and especially the horse; in our stables they are ever forcing themselves upon our notice, while so long as he is running wild, and breathing the untainted air, they are never seen; and in other animals, with the exception of the dog, they are but rarely witnessed.

The front of the ball of the eye, and the inner surface of the eyelids, are covered with a membrane, the conjunctiva, most of the blood-vessels of which are colourless. This membrane is the seat of common Ophthalmia, in common speech, of *inflamed eye.* Whatever irritates, causes inflammation; and hence we see how the application of any foreign body, a few particles of sand, or a hair, may produce ophthalmia. This is the only disease of the eye which has been noted in cattle, and arising solely from the cause now mentioned. Sometimes these bodies are actually impacted into the membrane; a straw or hay seed may be so fixed, that all the efforts of the animal may fail in removing it; the eye becomes red and inflamed, and hence the importance, in all cases, of carefully examining the organ; and satisfying ourselves there is no cause of external irritation present. It is not, however, to be supposed that these foreign bodies are the sole cause of ophthalmia in the horse. From the state of the constitution, exposure to weather, and often the contamination of a filthy stable, idiopathic ophthalmia arises. The conjunctiva and its offshoots, towards the lachrymal gland, and elsewhere, are implicated. It is found universally red and inflamed, the eye

is very sensitive to light, it waters much, and there is pain. This may excite general fever, or it may not; and this is always an important element. It may continue a long while, and prove troublesome without the deeper parts of the organ being implicated, or they may be involved; and it may be *acute*, with a tendency to high inflammatory symptoms, or it may be *chronic*, where there is the very opposite, namely, weakness and debility, in the parts, and in the frame; this latter state is apt to be quite as tedious, though not so painful, as the former. This distinction should never be forgotten in practice. When called to treat a case of this common ophthalmia, after ascertaining there is no irritation from a foreign body, we are first to examine the state of the stable, that the air is not impure, or too hot. If a horse has previously had inflammation of the eye, this attack may be nothing more than a local affection of the vessels, and possibly a wash, or rather an injection, of some simple collyrium,* once or twice a day, is all that is required. These external applications should not be used too strong. Bran mashes should be substituted for corn, and a laxative prescribed; the horse should not be exposed to the inclemency of the weather, and the light in the stable should be moderated. All this may by some be regarded unnecessary and troublesome; but

* Collyria. *Cooling*—Sugar of lead, one drachm; opium wine, one drachm; water, two pounds. *Stimulating*—Sulph. zinci, two drachms; opium wine, one drachm; water, two pounds; or nitrat. argenti, half a drachm, aquæ distill. one pound.

so long as it is a fact that one attack is apt to induce another, and that these in the long-run destroy the sight, it is the greatest folly not to meet, and if possible remove at once, the present ailment, and prevent the future tendency to it. If the symptoms do not speedily yield to this treatment, we must determine whether there is inflammatory diathesis, or chronic debility; the condition of the animal, of the pulse, of the eye, are all to be considered, and if these show that mischief threatens, the antiphlogistic regimen in all its parts is to be energetically applied, and the eye is to be protected from the stimulus of light; fomentations and injections are carefully to be applied, and setons introduced. These directions are given under the supposition I have to deal with acute ophthalmia. When it is chronic, this treatment would be detrimental, both to the disease and the constitution. In the chronic form, the local treatment generally consists in stimulating collyria and setons, and the constitutional, instead of being lowering, must be strengthening. A peculiar, and not unfrequent cause of irritation we must not omit, which consists in the inversion of the lower eyelid, whereby the eyelashes constantly play upon the eye-ball, and thereby inflame it, constituting the disease called Trichiasis. This complaint we have often witnessed in dogs and cattle, but seldom or never in the horse. Pulling out the eye-lashes affords but a temporary relief, as they soon grow again in a wrong position. A part of the loose skin of the eyelid must itself be removed, by pinching up a portion, and removing it with scissors,

and healing with stitches ; after this, when the parts heal, the cilia are found restored to their proper position. It is in this connection that NEBULÆ and SPECKS ON THE CORNEA are to be considered ; the former being more superficial, the latter dipping more deeply into the substance of the part. Directly in the sphere of vision, these of course impede it, and cause obscurity of vision. Even here, we must proceed gently. These blemishes are the pure consequences of inflammation, and this subdued, their tendency is to disappear. Time and nature will do much ; and the duty of the practitioner consists in helping forward the salutary process where necessary, by gently stimulating washes, whilst irritating powders should be avoided in all cases. OPEN ULCERS frequently occur in the cornea of dogs, and are always to be viewed with alarm, as they may speedily cut deep. They should be delicately touched with a fine point of lunar caustic, by which the morbid action is usually changed.

As the conjunctiva is liable to acute inflammation, so is it with the internal membranes, the choroid, iris, etc. It seldom, however, happens in the lower animals, that an opportunity is afforded of examining these parts under disease separately ; and hence, what has been called INFLAMMATION OF THE INTERNAL EYE, SPECIFIC INFLAMMATION, AND MOON BLINDNESS, may be considered as an inflammation of the whole internal parts of the eye. That there is any thing *specific* about this complaint, I do not believe, although high authorities have proceeded so far as to distinguish it as the specific

gouty ophthalmia. All that we are to learn from this is that the constitution is often at fault, and must be regulated; that there is an inflammatory diathesis, and that every error in diet or treatment tells upon the weakened part. This inflammation is apt to move from one eye to another; and overcome once, to return again and again (hence its name moon blindness), till the sight is entirely lost; all which, we believe, is owing mainly to two causes already hinted at; namely, that due care is not taken of the organ in early attacks, and in endeavouring to restore the constitution to sound general health. These views are to be our guides in the treatment; and if this required to be decided in the ophthalmia already dwelt upon, still more is it necessary in that now under consideration. As to the symptoms, this internal inflammation may exist without the external parts participating, but usually they are soon involved. One symptom very pathognomatic we must also add; it is a whitish opaque state of the cornea, which supervenes in a few hours, completely obscuring vision, and interfering with our perception of what is going on within the eye. This is not to be viewed as a distinct disease of the cornea, as is often supposed, but merely the result of the fulness and pressure of the parts behind; and were that once relieved, the cornea would immediately regain its transparency. As to treatment we have scarcely any thing to add. The sight, and the whole value of the animal is at stake, and what is done must be done promptly and thoroughly, and the animal should not be removed from the sick

list till he is in sound wholesome condition, sound in lith and limb, when he would be as little liable to future attacks as others.

Cataract is an opacity of the lens or its membrane. It may follow as a consequence of the disease last described, when no remedy can be of any use, as the whole organ is disorganized; or it may occur as a pure idiopathic disorder, when, ere long, it will completely obstruct vision. In this form it usually appears in the dog. This complaint can only be remedied by an operation; and extraction being exceedingly difficult in the horse, all attempts to perform it should be relinquished. Couching would be more easily performed. But still the removal of the lens is so detrimental, that it is scarcely worth a trial.

Gutta Serena, or *Glass Eye*, when pure, is an affection of the retina, or of the brain, which fails to receive the usual impression from light. Professor Coleman had a horse which fell backwards, on one side of the head, and the opposite eye became amaurotic, probably from injury to the brain. An attack of apoplexy often produces the same effect; or it may be acute inflammation of the retina; or chronic, which may never have attracted observation. Depletion may at first be tried; and then the use of setons, with careful attention to the general health. Worms, the *filaria* already mentioned (p. 84), occur in our East Indian possessions, in the aqueous humour of the eye of the horse, a curious locality, their occupancy of which is not readily accounted for. Twenty cases sometimes occur during

a twelvemonth in a single cavalry stud. On puncturing the cornea, the prisoners escape, and this is the only means of cure, and frequently succeeds.

The Ear of the dog is liable to several diseases, of which the internal and external *canker* are the most considerable. The former consists of irritation and ulceration of the tube, with discharge of matter, sometimes of blood, occasionally closing the ear, and producing deafness; or the ulceration may spread to the internal parts, and produce death. This chiefly occurs in water-dogs. Injections of solutions of sugar of lead, white vitriol, or nitrate of silver, or dusting into the ear oxide of zinc, are the most powerful local remedies, and the general state of health must be improved. Canker in the outside of the ear appears most frequently in smooth-coated dogs: and the same kind of washes, with the decoction of oak bark and iodine ointment, are the most effective remedies. If it does not yield to these, the ear must be rounded, and the disease extirpated by the knife. The ear of the horse is occasionally affected with dry gangrene, and I have seen a case of this kind, in which the concha dried up, became withered, and dropped off.

Cutaneous Affections. The name Surfeit has been given to a crop of small tumours about the size of hempseed or large peas, which break out suddenly over the bodies of horses, especially in spring; often beginning at the neck, and frequently disappearing as quickly as they come, being attended occasionally with itchiness. Its pathology is obscure. The digestive organs are sup-

posed to be at fault ; and poisonous herbs, a draught of cold water when the animal is heated, sudden exposure to cold and damp, calcareous matters, and worms, are the suspected causes. Moderate bleeding and laxatives form the surest remedies. The somewhat continued use of doses of antimony, nitre, and sulphur, has been much commended. The horse should be comfortably clad, and should receive regular exercise.

Mange is a very common and most loathsome disease of the domestic animals, arising from a cause the very reverse of that implied in the name of Surfeit, being the result of under-feeding, starvation, and neglect. It is in a high degree contagious ; for not only contact with an infected animal, but even with the sordes from his body wherever they are found, is sufficient to produce it. While we thus state that mange is common in the lower animals, we mean nothing more than that a disease of the same general character may affect them all. It is sometimes supposed that in all it is specifically the same, and that the itch in man, and the mange in the dog, are identical with the disease in the horse, the ox, and the sheep. This, however, I apprehend is carrying the matter too far. It is said the mange in cattle has been propagated to the horse, and from the horse to cattle ; but it is held there is no decided instance of the mange in the dog being communicated to the horse, and still less of the mange of the quadruped being communicated to man, or the itch of man to the quadruped. I may here however mention, that I have seen a herd of cattle labouring under ring-worm, which is a modifica-

tion of the complaint, as well as two boys who were keeping them, infected with the same complaint. Ringworm, either in animals or in our own species, is speedily cured by rubbing on iodine ointment for a few days. In the *Horse* I have noticed two varieties, the one of which is vesicular, and in this I am persuaded animalculæ abound, whilst in the other there is only simple desquamation, with oozing of ichor and falling off of the hair. This variety is much the most common in summer. The face, particularly round the eyes and lips, the sides of the neck, the withers, shoulders, axillæ, and thighs, are the parts most conspicuously manged. The grand cause, as I have already stated, is under-nourishment, what is technically called *Poverty;* but when once induced, if care be not taken, it will spread widely. In stables I consider it a token of want of care, and insufficient dressing. When wishing to rid an animal of the complaint, or to guard against its being infected, the most minute attention must be given to its clothing and furniture, as brushes, combs, pails, manger, etc.: these must be purified and kept uncontaminated; after this the cure with a little trouble is readily effected. As to constitutional treatment, gentle laxatives and alteratives should be prescribed, and the food be nourishing and soft. As to local, sulphur ointment, in any of its well-known formulæ, combined occasionally with some preparation of mercury, iodine, or tar with rape-seed oil, are sovereign remedies. In *Cattle* and *Sheep*, the ichorous matter is apt to collect in the neglected hair and wool, and hence the name Scab-

MANGE, SCAB, and SCURF. In commencing the cure, these sordes must be washed off, and *salving* must be most freely administered. This should be done at the first appearance of the complaint, for when once introduced into a flock it greatly diminishes its value. It seems to spread not so much by direct contact, as from the infected stones, banks, etc., which are the principal resorts of the flock. In *Dogs*, the disease is obstinate, and exhibits several varieties. One of them is called the *Red-mange*, in which there is no particular eruption, but a general redness of the skin, which is hot to the touch. Sulphur, sulphuric acid, chlorine, mercurials, tobacco, and hellebore, are the local remedies; and laxative and alterative medicines, with abundant light feeding, the general.

ERYSIPELAS in sheep appears in various slight modifications, which have received different names. WILDFIRE, it is said, generally shews itself at the beginning of winter, and first attacks the breast and belly. The skin inflames and rises into blisters, containing a reddish fluid, which escapes and forms a dark scab. The animal sometimes fevers. Venesection should be used, the skin should be washed with a solution of sugar of lead or with lime water, and physic given, such as salts and sulphur; afterwards a few doses of nitre. Under a somewhat severer form, it is apt to spread quickly among the flock. It appears generally in autumn, and does not continue above eight days at a time, although the sheep once affected are liable to a relapse. The treatment is the same as in wildfire, but somewhat

more vigorons. MALLENDERS is the name given to a scurfy and somewhat obstinate eruption on the back of the knee of the horse in the fore-leg, and SALLENDERS to a similar affection in front of the hock in the hind one. Washing with solution of corrosive sublimate, or with sugar of lead, or anointing with iodine ointment, with an occasional laxative, and diuretic, should effect a cure. SADDLE-GALLS are sores arising from the friction of the saddle, for which a strong solution of salt with tincture of myrrh is a good application, while attention should be paid to the padding of the saddle. The tumours which sometimes result from the pressure of the saddle go by the name of WARBLES; to which, when they are produced by the larva of the gadfly, ulcerate, and the skin becomes hardened, the name of SITFASTS is applied, from the callous skin which adheres to their centre. Goulard water may be used to disperse the swelling; a digestive ointment will remove the sitfast, and the sore should be healed with a solution of sulphate of zinc.

The well-known and unsightly disease called GREASE, is a morbid secretion from the cutaneous pores of the heels and neighbouring parts, of a peculiar greasy offensive matter, attended with irritation and increased vascular action. It is most frequently seen in coach and cart horses, but often also in young colts which are badly cared for; it is most common in the hind feet, but occurs in all. Its main cause seems to be sudden changes in the condition of the foot from dry to wet, and from heat to cold, greatly augmented, of

course, by evaporation, in consequence of neglect of drying the parts, and from want of cleanliness. It is seldom seen in thorough-bred horses, and this probably because they are well groomed. The first appearance of grease is a dry scurfy state of the heel, with heat and itchiness. Swelling succeeds, with cracks in the heels, to which a tendency to lameness follows; the discharge augments in quantity, and the hair begins to fall off. Deep fissures are apt to become prominent symptoms, and to occur sometimes at the upper portion of the fetlock; in the former case they are designated Dry-cracks by farriers, in the latter Rat-tails. Pustules now arise, which burst, and expose great coarse granulations, which have received the name of Grapes, and which, with the thickened skin, become tough and hard, almost horny. The diseased leg at this time may be thrice its natural thickness. As to treatment, prevention being better than cure, I re-echo the statement of Professor Coleman regarding cavalry horses, that the soldier deserves punishment whose horse becomes greasy. In the early stage, the parts should be washed twice a day with soap and water, and a solution of sugar of lead and sulphate of zinc applied; this may not be chemically scientific, but I have found it superior to anything else. Even in old and aggravated cases it is very efficacious. When grapes abound, powdered sulphate of zinc should be introduced among them, which is found often to supersede the application of the actual and other cauteries; and in like manner strong washes with diluted

sulphuric and nitric acids prove not less efficient. I have also found a solution of corrosive sublimate, and of iodine ointment, excellent remedies. If the horse be strong and full of flesh, laxatives should be given, followed by diuretics; if weak, tonics may be added to these last. The feeding too must be varied with the condition;—green meat and carrots should be given, and mashes frequently as a substitute for corn. During convalescence regular exercise is indispensable; and bandages and pressure hasten the cure.

Warts or Angle-berries frequently occur in the horse, and in cattle, and are troublesome, more especially in calves. They appear about the eyelids, ears, nose, neck, groin, sheath, and are apt to spread. They often require removal. Sometimes you must cast the horse, and remove them with the scissors, knife, and cautery, or with a ligature. Escharotics, however, have great efficacy, such as alum, blue-stone, corrosive sublimate, and sometimes arsenic. Encysted Tumours also are by no means uncommon, a kind of *Talpæ*, which may generally be removed by simple incision, having no decided root or adhesion.

The domestic animals are apt to be annoyed with vermin, which slight knowledge and attention would readily remove. In particular states of hot weather, Flies, especially some species of the *Tabanidæ*, are great nuisances; they will make a spirited horse unmanageable, will drive cattle from their pasture, to scamper about in a state of extreme agitation; and as to sheep, the Ettrick Shepherd says—"The flies were

at this time settled in the fold in such numbers, that we could with difficulty see each other; the heads of the sheep were swollen and black, and seemed all over a scab, the flies being settled on them like a black cloud. A few were anointed with train oil, and no sooner were they turned among the rest, than in less than a minute, not a fly was to be seen." Spirit of tar, added to the oil, renders it more efficacious; and as the fly will not face these remedies, horses and cattle should be protected by it. FLEAS are very troublesome to dogs. Washing and combing are not without efficacy, as is also a little snuff or tobacco-water, though it frequently poisons the dog. Mr. Blaine says, "the only tolerably certain cure I know, is to make the dog sleep on fresh yellow deal shavings." Rosin and bran may be usefully applied. Oil, however, we believe, is a specific. We have invariably found it so for LICE, so common in horses, cattle, sheep, and dogs, and it is safer than tobacco liquor. In horses, the prevalence of this filthy vermin shews want of dressing, although it is often connected with poverty and mange. In the slighter visitations we have invariably found that a single dressing of olive-oil alone will cause their disappearance from all the above-named animals, or a solution of corrosive sublimate, but the use of the latter requires care and caution. For the TICK in sheep, a mixture of tar and turpentine with oil is a speedy and certain poison; and for the MAGGOT, sometimes a most fatal vermin in this quadruped, the principal object is the shepherd's watchful care; as soon as discovered, the

affected part must be shaved, or rather the hair trimmed off, and spirit of turpentine, spirits of tar, or of tar with oil, or a solution of corrosive sublimate, applied.

Shoeing.—This important branch of veterinary instruction has long opened up, and still continues to be, a wide and unexhausted field of practical inquiry and skill to the profession. Numerous are the treatises which have been written on the subject, and very different are the kinds of shoes which have been invented, according to the various views of their respective advocates, to give security and freedom to the action and motion of the horse's foot, as well as to prevent the occurrence of injury to, or disease in it. This is a matter of so great value, that I consider it indispensable, in the education of the student, that he should be instructed not only in the best modes of shoeing, but that he should be taught to put hand to the plough, and be able to do the practical part of the work himself, that is, to shoe.

After a personal experience of nearly fifty years in the service of the profession, commencing with the practical art at the anvil, and pursuing a long course of anatomical pursuit, and being brought into daily contact with the horse through practice and clinical inspection, and otherwise, both in a sound and unsound state, I have come to the conclusion, that the whole art of shoeing consists in applying a shoe, so that it will serve as a defence to the foot, without injuring it. This is to be done best by what is called a seated shoe, having a

level part for the crust to rest upon, and from which the web of the shoe is to be levelled off inwards, in order to avoid pressure on the sole. The shoe should be attached by means of from five to nine nails, according to the size and weight of the shoe. The foot is to be prepared for the shoe by making the crust level with a rasp, so as to allow the seating of the shoe to rest upon, and be applied accurately to the crust, by which an equable bearing will be given ; and this is a point of primary and paramount importance to be attended to. At the heel, however, a slight degree of rasping may be made to the extent of allowing daylight to be seen between the shoe and the heel. The sole is to be moderately pared, so as to preserve the elasticity and natural action of the part. The application of wet felt or tow, or of soft clay or cow-dung, to the sole of the fore feet every night will promote that object. At the angle of the inside heel a little paring is to be made, so as not to allow any portion of the crust to be doubled in upon the sole, as corns otherwise are apt to be formed. The heels, however, should be cut down as little as possible, but the toe must be pared down and shortened every time the horse is shod, and the removal of the old, and substitution of the new shoes should not be prolonged beyond three weeks, or a month at farthest. The frog requires only the rags or loose parts to be cut away, but the old plan of lowering the heel to give the frog pressure is worse than useless. These observations, at all times necessary, whatever be the form of the horse's foot, are especially to be attended

in the shoeing of one having a flat foot. From such neglect I have known horses possessing the most splendid action when properly shod, have all at once, by the application of a flat shoe without a proper bevel, become stammerers to a degree as to be very unsafe roadsters. As the foot is much exposed to injury from a variety of causes, a rigid examination is required in all cases of lameness, in order to ascertain its seat and origin. Punctures from nails in shoeing, called prickings, contusions, and wounds, however occasioned, into which foreign bodies or sand get inserted, are frequent causes of lameness; as well as seedy toes and corns, the latter of which must be pared out, and poultices applied, and afterwards hot tar and tow.

The shoe should extend back at the heels, an eighth or a quarter of an inch beyond the point of the heel; and in the case of hunters or hacks should be cut off at that length. The hind shoes should have the outside heel turned down to give a catch, and the inside thickened, to keep the foot level, care being taken to round off the shoe in a cress, to prevent over-reaching. Horses for harness should have heels in both hind and fore feet, in town, to prevent slipping; and in heavy draught horses, the shoe should have tips on the toes as well as heels to give a catch, by which these horses have the animal power greatly increased, so much so that, while the dray horses in London, which are all shoed quite smooth and without any catch, draw little more than their own weight, say about one ton, while in Edinburgh, strong heavy horses are able to draw five tons

when properly shoed with heels and tips. In London where the powerful dray horses are all shod smooth, a great waste and loss of power is sustained ; and this erroneous practice is founded on the dread of contracting the foot from the frog being removed from pressure ; but my experience is not in accordance with such a view.

The following list comprises the names of the most eminent British authors, whose writings, in the different departments of Veterinary Science, have greatly contributed to its improvement and progress. It would, however, be a culpable omission to pass over, without recognition, the very important services which foreign veterinarians have rendered to the profession by their valuable researches. But it is not within the scope and object of this manual to give a detailed enumeration of these authorities, their labours being generally more of a speculative, and theoretical, than practical nature. For further information regarding them, I beg to refer the reader to Professor Ley's treatise, which contains a complete list of their works, and to the "Dictionnaire generale de Medecine Veterinaire, etc.," edited by MM. Lecoq, Rey, Tisserant, et Tabourin. Among the works of foreign reputation, the writings of Jourdain, Gurlt, Rigot, Colin, L'Graf, Bouley, T. Girard, Chauveau, Baumeister, M. Hurtrel D'Arboval, etc. etc., are especially deserving of notice. Such as are not familiar with the different languages in which these treatises are written,

will acquire without the labour of translation, from Mr. John Gamgee's late publications, a considerable amount of information, which he has taken and compiled from these authorities.

While referring to British veterinary authors, I take occasion, with much pleasure, to notice various journals published in this country, which contain much recent, highly useful, and practical information on almost all matters relative to Veterinary Science: among the principal of these may be enumerated—the Veterinarian, the Transactions of the Highland Society of Scotland, and of the Royal Agricultural Societies of England and Dublin, the North British Agriculturist, and Scottish Farmer; and in the Library of Useful Knowledge, published in 1840, many interesting observations are well worthy of perusal, under the articles of the horse, cattle, sheep, dog, etc. In the columns of the "Field" and "Mark Lane Express," veterinary contributions, of more or less merit, may occasionally also be found.

All the treatises in the appended list, with the exception of those by one or two very old authors, may be consulted by, as they are all readily accessible to, the profession.

LITERATURE OF THE SUBJECT.

Atken on the Beauties of the Horse.
Bartlett's Farriery.
Blacklock on Sheep.
Blaine's Diseases of Dogs, etc.

Blaine's Outlines of the Veterinary Art.
Bordman's Dictionary of the Veterinary Art.
Brown on the Teeth of the Ox.
Cheaveau's Anatomy.
Cherry on Broken Knees.
Clark's (B.) Essay on the Bots of Horses, etc.
Clark's (B.) Dissertation on the Foot of the Horse, with Experiments on Shoeing, and Description of a new Horse Shoe, etc.
Clark's (B.) History of the Horse.
Clark's (B.) New Pharmaeopœia for Horses.
Clark (J.) on the Prevention of the Diseases of Horses.
Clark (J.) Treatise on Shoeing, etc.
Clark (J.) Veterinary Prophylaxis.
Coleman's Observations on Structure, and Foot of Horse.
Dick, Prof., on Cholera in Domestic Animals.
Dickson on the Digestive Organs.
Dixon on Live Stock.
Dodd on the Anatomy and Physiology of the Horse.
Dorvill on the Race Horse.
Dun's Hereditary Diseases of Sheep and Pigs, Horses and Cattle.
Dun's Veterinary Medicine.
Etherington on Viviseetion.
Field's Veterinary Record.
Fitzwagram on Shoeing.
Freeman's Observations on the Horse's Foot.
Gant on over-feeding Cattle.
Gerard on the Teeth of the Horse.
Goodwin's System of Shoeing Horses, etc.
Gunter's Manual of Veterinary Homœopathy.
Haycock's Contributions to Veterinary Pathology.
Haycock's Veterinary Homœopathy.
Haycock's Principles of Veterinary Medicine.
Haycock's Gentlemen's Stable Manual.
Hogg's Shepherd's Guide.
Huzard's Esquisse de Nosographie Vétérinaire.

Laurenee's History and Delineation of the Horse.
Lawrenee's General Treatise on Cattle.
Lawrence's Inquiry into the Economy of the Horse.
Library of Useful Knowledge.
Low on Domestieated Animals.
Maekenzie's Diseases and Management, ete., of Sheep.
Markham's Masterpiece.
Mayhew on the Dog.
Mayhew on the Horse's Teeth.
Mayhew's Illustrated Horse Doetor.
Miles on the Horse's Foot.
Morton on Caleulous Coneretions.
Morton's Veterinary Pharmaey.
Moyan's Horses.
Nimrod on the Horse and Hound.
Oliphant on the Law of Horses and Gaming.
Osmer on Shoeing. Morerofton, ——.
Peale's Observations on Diseases of the Horse.
Pereivall's Lectures on the Vet. Art.
Pereival's Systematie Treatise on the Diseases and Lameness of the Horse. Also, his Anatomy of the Horse.
Percival's Hippopathology.
Rarey on Horse-taming.
Riehardson on Dogs.
Riehardson on Pigs.
Ruini's Anatomia del Cavallo, ete. Veniee, 1618.
Sainbel's Lectures on Farriery.
Saplin's Farriery.
Simmonds on the Age of the Ox, Sheep, and Pig.
Simmonds on Variola Ovina.
Skellett's Treatise on Cattle.
Solleysell on Shoeing.
Snape's Anatomy of an Horse. London, 1683.
Spooner on Cattle, by White.
Spooner on the Foot.
Spooner on Sheep.
Spooner's Veterinary Art.

Stewart on the Purchase of Horses.
Stewart on Stable Management.
Stonehenge on the Greyhound.
The Horse, Library of Useful Knowledge.
The Quarterly Journal of Agriculture.
The Veterinarian, Periodical Journal.
Thomson's Popular Essays on the Diseases of Horses, Cattle, Sheep, Swine, and Dogs.
Turner on the Horse's Foot.
Varnell on some Deformities of Limbs of Horses.
Vines on the Glanders.
White's Treatise on Veterinary Medicine.
White's Dictionary of the Veterinary Art.
Wilkinson on Tetanus and Epidemic Catarrh.
Winter on the Diseases of the Horse.
Williams on Pleuro-Pneumonia.
Youatt on Cattle, the Dog, the Horse, the Pig, and the Sheep.

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FINIS.

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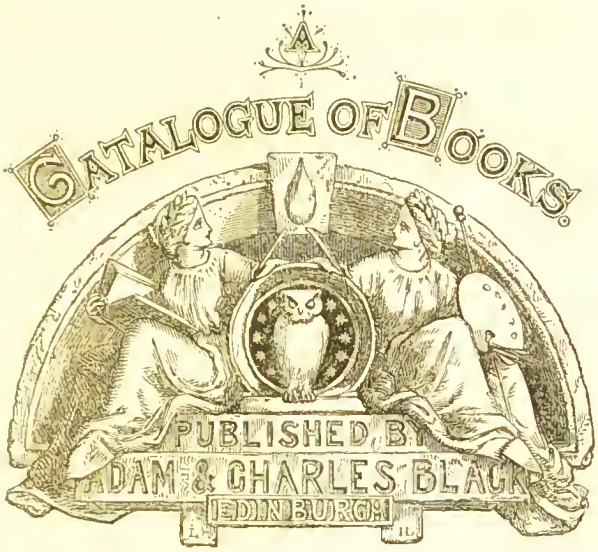

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